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# **Alberta Fire Code 1997**

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# Preface

The Alberta Fire Code 1997 (AFC) is prepared by the Alberta Fire Technical Council and is published by the National Research Council of Canada (NRC).

The AFC comprises a model set of technical requirements designed to provide an acceptable level of fire safety throughout Alberta.

Historically, building code and fire code requirements were developed largely on the basis of property protection, but current fire protection legislation gives increasing emphasis to matters affecting life safety. Life safety is a primary objective of the AFC and property protection requirements are included to the extent that they make a direct contribution to life safety, or for the purpose of controlling conflagrations or large loss fires, which can have serious social and economic impact on the community as a whole.

The AFC contains safety measures for both the occupant of the building and the fire fighter. In the Code, measures bearing on property protection are frequently employed for the purpose of achieving safe evacuation or rescue of occupants; these measures may also assist in containment or control of a fire. However, their role in promoting life safety is always the primary reason for their inclusion.

The Alberta Fire Code was established by the Alberta Fire Technical Council after consultation with municipal authorities, provincial government departments, associations, other affected parties and Code users.

**The National Fire Code of Canada.** By agreement with the National Research Council of Canada, Alberta is committed to using the National Fire Code of Canada as its base document in regulating fire standards.

The National Fire Code of Canada (NFC) is published by the National Research Council through the Canadian Commission on Building and Fire Codes (CCBFC). It comprises a model set of technical requirements designed to provide an acceptable level of fire protection and fire prevention within a community. The Code is written in a form suitable for adoption by appropriate legislative authorities in Canada.

**Committees.** The Code has been developed and continues to be developed through the voluntary assistance of many experts from coast to coast. The Canadian Commission on Building and Fire Codes has direct responsibility under the National Research Council of Canada for the preparation and publication of the Code. The members of the CCBFC are appointed by NRC. They serve as individuals and not as designated appointees of any organization and the membership is broadly representative of all major fire safety interests in Canada.

The CCBFC is assisted in the technical aspects of code writing by standing committees, each of which is responsible for specific portions of the Code. The members of each standing committee are knowledgeable in the particular field for which the committee is responsible. Building and fire officials, architects, engineers, contractors, building owners and others share their experience in the national interest. The CCBFC wishes to acknowledge the assistance provided by the many individuals who have contributed to the production of this edition of the Code. The CCBFC also wishes to express its appreciation to the standards writing organizations whose standards are referenced throughout the Code documents.

**IRC Staff.** The staff of the Institute for Research in Construction (IRC) of the National Research Council provides technical and administrative support at the direction of the CCBFC. Technical problems revealed through the use of the Code are referred to the Institute for study. IRC's participation makes available to the Commission the most up-to-date information on fire safety practice and technology.

**Changes from the 1992 Edition.** Several editorial and technical changes have been included in this edition. The National Fire Code of Canada had undergone changes that involved reorganizing the different Parts of the Code. For example, Part 3 now contains all the requirements for both indoor and outdoor storage that were previously located in Part 5. Part 5 now contains issues that deal with hazardous processes and operations that were located in Part 3.

**Part 1.** The definition section now addresses the system of Safety Code Officers established under the Safety Codes Act.

**Part 2.** Significant changes include; parking of propane fuelled vehicles in structures; clarifying the determination of occupant load calculations; use of student prepared artwork on walls and ceilings of classrooms and corridors.

**Part 3.** An important change to note is the consolidation of storage requirements for indoor, outdoor and dangerous goods. The exception in this Part is the storage of flammable liquids and combustible liquids which remains in Part 4. The storage of fireworks has also been added to Part 3 and is separate from the permit and discharging process which is located in Part 5. Specific adjustments are made to the storage of ammonium nitrate. A broader requirement for water supplies for outdoor storage areas is introduced.

**Part 4.** The Code now identifies the role of the Petroleum Tank Management Association of Alberta (PTMAA). The Code now recognizes additional ULC standards for tanks, products and materials. A new Article on unattended self-service outlets is introduced. A broad approach is used to regulate fuel dispensing by defining service stations to mean fuel dispensing stations.

**Part 5.** This Part is now a consolidation of all hazardous processes and operations. A new Section on laboratories is introduced. Welding and cutting operations are defined as hot works.

**Part 6.** Improvements are made to defining the qualification of persons performing service work on portable and fixed fire suppression equipment.

**Part 7.** Indicates the test procedures for any type of measure in any type of high building.

#### Fire Technical Council

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# Relationship between the Alberta Fire Code and the Alberta Building Code

A special relationship exists between the AFC and the ABC with respect to fire safety. The contents of both Codes must be considered in building design, construction and maintenance.

## **Coordination with the Alberta Building Code.**

An important feature of this Code is its close coordination with its companion document, the Alberta Building Code, which is established under the direction of the Building Technical Council. To avoid duplication of requirements in the two Codes, and also to provide flexibility in their application to existing buildings, the Alberta Building Code requirements are referenced in the Alberta Fire Code. When applied to existing buildings, these requirements are subject to the discretion of the authority having jurisdiction.

The Fire Technical Council and Building Technical Council have agreed that the two Codes should not only be developed but should also be administered as complementary documents, with both fire and building officials being involved in their enforcement. The role of each Code with respect to fire safety can be summarized as follows:

**Alberta Building Code (ABC)** — establishes a satisfactory standard of fire safety for the construction of new buildings, the reconstruction of buildings, including extensions, alterations, or changes in occupancy and upgrading of buildings to remove an unacceptable fire hazard.<sup>‡</sup>

**Alberta Fire Code (AFC)** — establishes a satisfactory standard for fire prevention, fire fighting and life safety in buildings in use,<sup>‡</sup> including standards for the conduct of activities causing fire hazards, maintenance of fire safety equipment and egress facilities, standards for portable extinguishers, limitations on building contents and the establishment of fire safety plans, including the organization of supervisory staff for emergency purposes. In addition, the AFC establishes the standard for prevention, containment and suppression of fires originating outside

buildings which may present a hazard to a community, and sets standards for the storage and handling of dangerous goods, and flammable and combustible liquids.

The two Codes have been developed as complementary and coordinated documents in order to reduce to a minimum the possibility of conflict in their respective contents. To aid in their effective application, fire and building officials must be fully conversant with the fire safety standards of both Codes. Such officials should be involved both in the review and the approval of plans with respect to fire safety prior to granting a building permit and with the inspection of buildings for fire safety. This is the only way to determine that all known hazards have been considered and a satisfactory standard of fire safety has been achieved.

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<sup>‡</sup> The extent of application of the ABC and the AFC to the upgrading of buildings to remove an unacceptable fire hazard should be based on the judgement of the authority having jurisdiction, who must deal with each case on its merits.



# A Guide to the Use of the Code

The Code is divided into 7 Parts, each Part being self-sufficient with cross-references where needed. A decimal numbering system has been used throughout the Code. 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. Code requirements are provided at the Sentence level (indicated by numbers in brackets), and Sentences may be broken down into Clauses and Subclauses. This structure is illustrated as follows:

2	Part
2.8.	Section
2.8.2.	Subsection
2.8.2.1.	Article
2.8.2.1.(1)	Sentence
2.8.2.1.(1)(a)	Clause
2.8.2.1.(1)(a)(i)	Subclause

A summary of the contents of the Code follows:

## Part 1 General

Part 1 contains the definitions of all words throughout the Code that appear in italic type, and stipulates how the Code is applied. It includes the necessary administrative requirements to ensure that the technical requirements can be applied with a minimum of difficulty.

## Part 2 Building and Occupant Fire Safety

This Part contains general fire safety requirements for all buildings. It provides for the control of common fire hazards, including those arising from smoking, open flames, storage and disposal of combustible materials, open air fires and incinerators, and addresses maintenance of fire separations, heating appliances and systems and air conditioning systems. In addition, it includes requirements for maintenance of fire department access and means of egress, establishment of fire safety plans and fire emergency procedures, and fire safety at demolition and construction sites. Portions of this Part deal with upgrading existing buildings to ensure an acceptable standard of life safety.

## Part 3 Indoor and Outdoor Storage

This Part contains requirements for the storage of combustible products and dangerous goods, both inside and outside of buildings.

## Part 4 Flammable and Combustible Liquids

This Part contains requirements for the storage, handling and use of flammable and combustible liquids, both inside and outside of buildings.

## Part 5 Hazardous Processes and Operations

This Part applies to processes and operations that involve a risk from fire or explosion or otherwise create a hazard to life safety.

## Part 6 Fire Protection Equipment

The requirements of this Part provide for inspection, testing and maintenance of portable extinguishers, fire suppression systems, fire alarm systems, water supplies for fire protection and emergency power installations, so as to ensure their continued safe operation. It also provides for selection and installation of portable extinguishers and for design and installation of automatic sprinkler systems and fire suppression systems where such systems are required by this Code.

## Part 7 Fire Emergency Systems in High Buildings

The requirements of this Part for inspection, testing and maintenance of fire emergency systems in high buildings complement specific requirements for such buildings found in Part 3 of the Alberta Building Code and in Chapter 3 of the Supplement to the National Building Code of Canada 1990.

## Appendix A Explanatory Information

Appendix A contains additional explanatory information to assist Code users in understanding the intent of the requirements contained in Parts 1 to 7. It is not a mandatory section of the Code.

## Appendix B Safety Codes Act

This shows the legislation under which the Alberta Fire Code is adopted, gives the powers of a

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safety codes officer and establishes the enforcement procedures and appeal mechanism.

**Change Indication.** Where a technical change or addition to the 1990 National Fire Code has been made, the requirements affected are indicated by a vertical line in the margin. No indication is provided where requirements have been renumbered or deleted.

A heavy vertical line in the margin indicates an addition or amendment to the 1995 National Fire Code at the time it was adopted in Alberta as the Alberta Fire Code 1997.

**Renumbering.** There is extensive renumbering due to additions, deletions and relocation of requirements. Care should be taken therefore in relating requirements in previous codes with the 1997 edition.

**Metric Units.** All values in the Code are given in metric units.

**Public Comment and Inquiries.** Comments and inquiries on the use of this Code and suggestions for its improvement are welcomed and should be submitted to:

Administrator, Building and Fire  
Alberta Labour  
705, 10808 - 99 Avenue  
Edmonton, Alberta, Canada  
T5K 0G5

# Part 1 General

## Section 1.1. General

### 1.1.1. General

#### 1.1.1.1. Responsibility

1) Unless otherwise specified, the *owner* shall be responsible for carrying out the provisions of this Code.

2) This Code may be cited as the Alberta Fire Code 1997 made pursuant to Section 61 of the Safety Codes Act.

#### 1.1.1.2. Records

1) Where this Code requires that records of inspections, maintenance procedures or tests be retained for examination by the *authority having jurisdiction*, such records shall be retained during the required time interval between the inspections, maintenance procedures or tests, or for 2 years, whichever is greater.

### 1.1.2. Equivalents

#### 1.1.2.1. Equivalence

1) The provisions of this Code are not intended to limit the appropriate use of materials, systems, equipment and procedures not specifically described herein.

2) Materials, systems, equipment and procedures not specifically described herein or that vary from the specific requirements in this Code or for which no recognized test procedure has been established, are permitted to be used if it can be shown that these alternatives are equivalent on the basis of tests, evaluations or past performance.

3) Where no published test method exists, any test submitted to determine equivalence shall be designed to simulate or exceed anticipated service conditions or shall be designed to compare the performance of the material, system, equipment or procedure with similar materials, systems, equipment or procedures that are known to meet the requirements of this Code.

#### 1.1.2.2. Equivalent Test Standards

1) The results of tests based on test standards other than as described in this Code are permitted to be used provided such alternate test standards will provide comparable results.

#### 1.1.2.3. Alternatives

(See Appendix A.)

1) Where a provision of this Code requires compliance with one or more requirements of the Alberta Building Code, the provision is deemed to be satisfied if

- a) the *building* or fire protection measure was constructed or installed after April 1, 1974 and conforms with regulations in force under the Uniform Building Standards Act or the Safety Codes Act at the time of construction or installation, or
- b) the *building* or fire protection measure does not conform to Clause (a) but
  - i) meets the requirements of an *approved* guideline issued for a specific occupancy, or
  - ii) where no *approved* guideline has been issued, the *building* or fire protection measure is constructed or installed in a manner that provides a level of life safety which is acceptable to the *authority having jurisdiction*.

2) Alternatives to requirements in this Code not within the scope of Sentence (1), may be permitted provided

- a) a degree of life safety acceptable to the *authority having jurisdiction* is provided by existing fire protection measures, or
- b) measures are taken to provide a degree of fire safety that is acceptable to the *authority having jurisdiction*.

#### 1.1.2.4. Intervals between Inspections and Tests

1) Longer intervals between the inspections and tests specified in this Code may be permitted provided the *authority having jurisdiction* is satisfied that such intervals do not reduce the reliability of the system or equipment requiring inspection or testing.

## 1.1.2.5.

### 1.1.2.5. Interpretations

1) A person may apply to an *Administrator* in writing for an interpretation of this Code, and the request shall

- a) include specific Code references, and
- b) include a statement identifying the ambiguity or lack of clarity resulting in the request for an interpretation.

2) After the *Administrator* has reviewed a request submitted pursuant to Sentence (1), he may issue a written interpretation.

3) An interpretation issued pursuant to Sentence (2) is applicable throughout Alberta when determined by the *Administrator*.

### 1.1.2.6. Extract from the Safety Codes Act

1) An *Administrator* or a *safety codes officer* may issue a written variance with respect to any thing, process or activity to which this *Act* applies if the *Administrator* or officer is of the opinion that the variance provides approximately equivalent or greater safety performance with respect to persons and property as that provided for by this *Act*.

2) An *Administrator* or *safety codes officer* may include terms or conditions in the variance.

3) A *safety codes officer* on issuing a variance shall notify an *Administrator*.

### 1.1.3. Referenced Documents

#### 1.1.3.1. Conflicting Requirements

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

2) Where reference is made to the Alberta Building Code, such reference is to the edition made pursuant to the Safety Codes Act.

#### 1.1.3.2. Referenced Dictionary

1) For definitions of words that are not defined in the Safety Codes Act or in Article 1.2.1.2., reference should be made to Webster's Third New International Dictionary.

#### 1.1.3.3. Effective Date

1) Unless otherwise specified herein, the documents referenced in this Code shall include all amendments, revisions and supplements effective to December 31, 1996.

2) Documents referenced in this Code shall be the editions designated in Table 1.1.3.3. (See Appendix A.)

Table 1.1.3.3.  
Documents Referenced in the Alberta Fire Code 1997  
Forming Part of Sentence 1.1.3.3.(2)

Issuing Agency	Document Number	Title of Document	Code Reference
AAFC		Pest Control Products Act and its Regulations	4.2.3.2.(2)
AECEB		Atomic Energy Control Act and its Regulations	3.1.1.2.(1)
ANSI/ASME	B16.5-1996	Pipe Flanges and Flanged Fittings	4.4.5.3.(1)
ANSI/ASME	B31.3-1996	Chemical Plant and Petroleum Industry Piping	4.4.2.1.(5)
API	5L-1992	Line Pipe	4.4.2.1.(4)
API	620-1996	Design and Construction of Large, Welded, Low-Pressure Storage Tanks	4.3.1.3.(1) 4.3.3.1.(1)
API	650-1993	Welded Steel Tanks for Oil Storage	4.3.1.2.(1) 4.3.3.1.(1)
API	1104-1994	Welding Pipelines and Related Facilities	4.4.5.2.(1)
API	RP 1107-1991	Recommended Pipeline Maintenance Welding Practices	4.4.5.2.(1) 4.4.11.7.(6)
API	2000-1992	Venting Atmospheric and Low-Pressure Storage Tanks	4.3.4.1.(1)
API	2200-1994	Repairs to Crude Oil, Liquefied Petroleum Gas and Products Pipelines	4.4.11.7.(6)

**Table 1.1.3.3. (Continued)**

Issuing Agency	Document Number	Title of Document	Code Reference
API	2201-1995	Procedures for Welding or Hot Tapping on Equipment Containing Flammables	4.4.11.7.(6)
ASTM	A 53-93a	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless	4.4.2.1.(4)
ASTM	A 193/A 193M-91a	Alloy-Steel and Stainless Steel Bolting Materials for High Temperature Service	4.4.5.4.(1)
ASTM	D 56-93	Flash Point by the Tag Closed Tester	4.1.3.1.(1)
ASTM	D 93-90	Flash Point by Pensky-Martens Closed Tester	4.1.3.1.(2)
ASTM	D 323-94	Vapor Pressure of Petroleum Products (Reid Method)	1.2.1.2.(1)
ASTM	D 3278-96	Flash Point of Liquids by Setaflash Closed-Cup Apparatus	4.1.3.1.(4)
ASTM	D 3828-93	Flash Point by Small Scale Closed Tester	4.1.3.1.(3)
CCBFC	NRCC 30629	Supplement to the National Building Code of Canada 1990	7.1.1.2.(2)
CGA	CAN/CGA-B149.5-M95	Installation Code for Propane Fuelled Systems and Tanks on Highway Vehicles	2.4.4.5.(1)
CGSB	CAN/CGSB-4.162-M80	Hospital Textiles — Flammability Performance Requirements	2.3.2.3.(1)
CGSB	20-GP-12Ma-1989	Braided Water Hose, Knitted or Spiral Wound Reinforcement	6.2.3.4.(1)
CPPI		Using the CPPI Colour-Symbol System to Mark Equipment and Vehicles for Product Identification (1990)	4.3.1.7.(1) 4.4.4.1.(3) 4.4.8.7.(1)
CPPI	PACE Report No. 87-1	Impressed Current Method of Cathodic Protection of Underground Petroleum Storage Tanks	4.3.9.1.(2) 4.4.3.1.(2) 4.5.11.2.(1)
CSA	CAN/CSA-B72-M87	Installation Code for Lightning Protection Systems	6.10.1.2.
CSA	CAN/CSA-B139-M91	Installation Code for Oil Burning Equipment	4.1.1.1.(3) 4.3.12.2.(2)
CSA	B306-M1977	Portable Fuel Tanks for Marine Use	4.2.3.1.(1)
CSA	B346-M1980	Power-Operated Dispensing Devices for Flammable Liquids	4.5.3.1.(1)
CSA	B376-M1980	Portable Containers for Gasoline and Other Petroleum Fuels	4.2.3.1.(1)
CSA	B620-1987	Highway Tanks and Portable Tanks for the Transportation of Dangerous Goods	4.2.3.1.(1)
CSA	CAN/CSA-C282-M89	Emergency Electrical Power Supply for Buildings	6.7.1.1.(1) 6.7.1.4.(1)
CSA	W117.2-94	Safety in Welding, Cutting and Allied Processes	5.2.1.1.(2)
CSA	Z245.1-95	Steel Line Pipe	4.4.2.1.(4)
ERCB	Guide G-55	Storage Requirements for the Upstream Petroleum Industry	4.1.1.1.(3)
Govt. of Alberta		Corrections Act and its Regulations	5.8.1.5.(1)
Govt. of Alberta		Forest Act and its Regulations	1.2.1.2.(1)
Govt. of Alberta		Forest and Prairie Protection Act and its Regulations	5.8.1.3.(1)

### 1.1.3.3.

**Table 1.1.3.3. (Continued)**

Issuing Agency	Document Number	Title of Document	Code Reference
Govt. of Alberta		Hospitals Act and its Regulations	5.8.1.5.(1)
Govt. of Alberta		Mental Health Act and its Regulations	5.8.1.5.(1)
Govt. of Alberta		Nursing Homes Act and its Regulations	5.8.1.5.(1)
Govt. of Alberta		Occupational Health and Safety Act and its Regulations	3.2.7.15.(2) 4.4.5.2.(1)
Govt. of Alberta		Public Lands Act and its Regulations	5.8.1.3.(1)
Govt. of Alberta		Safety Codes Act and its Regulations (also see Alberta Building Code)	1.1.1.1.(2) 1.1.2.3.(1) 1.1.2.6. 1.1.3.1.(2) 1.1.3.2.(1) 1.2.1.2.(1) 2.1.3.1.(1) 2.1.3.2.(1) 2.4.4.5.(3) 2.4.4.6.(1) 2.6.1.1.(1) 2.9.3.1.(1) 3.1.1.4.(2) 3.1.1.4.(3) 3.1.3.1.(4) 3.1.4.1.(1) 4.1.1.1.(3) 4.1.1.3.(1) 4.1.4.1.(1) 4.3.1.3.(1) 4.3.1.3.(2) 4.4.1.1.(2) 4.4.10.5.(2) 4.4.10.6.(1) 4.5.1.1.(2) 5.1.2.1.(1) 5.1.2.2.(1) 5.3.1.2.(2) 5.3.1.2.(3) 5.3.1.10.(2) 5.7.3.4.(1) 5.7.5.4.(1)
Govt. of Alberta		Social Care Facilities Licensing Act and its Regulations	2.10.2.1.(1) 5.8.1.5.(1)
Govt. of Alberta		Uniform Building Standards Act	1.1.2.3.(1)
Govt. of Alberta		Alberta Building Code 1997	1.1.2.3.(1) 1.1.3.1.(2) 1.2.1.2.(1) 2.1.2.1.(1) 2.1.3.1.(1) 2.1.3.2.(1)

**Table 1.1.3.3. (Continued)**

Issuing Agency	Document Number	Title of Document	Code Reference
			2.1.3.3.(3) 2.2.1.1.(1) 2.2.1.1.(2) 2.2.1.1.(3) 2.2.1.2.(1) 2.2.2.1.(1)  2.2.2.1.(2) 2.2.2.4.(2) 2.3.1.1.(1) 2.3.1.4.(1) 2.3.1.5.(1) 2.3.1.5.(2)  2.4.1.2.(1) 2.4.1.5.(1) 2.5.1.1.(1) 2.5.1.3.(2) 2.5.1.3.(4) 2.6.1.1.(1)  2.6.1.5.(1) 2.6.1.9.(1) 2.6.2.1.(1) 2.7.1.1.(1) 2.7.1.2.(1) 2.7.1.3.(1)  2.7.1.4.(2) 2.7.2.2.(1) 2.7.3.1.(1) 2.8.1.1.(1) 2.8.2.4.(1) 2.8.2.4.(2)  2.8.2.5.(2) 2.8.3.1.(1) 2.8.3.2.(1) 2.9.1.1.(1) 2.9.3.6.(1) 2.10.1.1.(1)  2.11.1.1.(1) 2.12.1.4.(2) 2.12.1.4.(3) 2.13.2.1.(1) 2.13.2.2.(1) 2.14.1.3.(1)  2.15.1.1.(2) 3.2.6.2.(1) 3.2.6.2.(2) 3.2.7.12.(3) 3.2.8.3.(1) 3.2.9.3.(1)

### 1.1.3.3.

Table 1.1.3.3. (Continued)

Issuing Agency	Document Number	Title of Document	Code Reference
			3.2.9.9.(1) 3.3.2.5.(1) 4.1.7.1.(1) 4.2.7.1.(2) 4.2.7.5.(2) 4.2.11.3.(1)  4.3.2.4.(2) 4.3.3.2.(1) 4.3.12.1.(2) 4.3.13.1.(1) 4.3.13.4.(1) 4.4.9.2.(3)  4.5.2.2.(3) 4.5.3.2.(2) 4.8.3.1.(1) 5.1.3.1.(1) 5.4.3.1.(1) 5.5.3.1.(1)  5.6.1.1.(2) 5.6.1.11.(1) 5.7.2.2.(1) 6.3.1.8.(1) 6.4.1.3.(1) 6.5.1.1.(1)  6.5.1.7.(1) 7.1.1.1.(1) 7.1.1.2.(1) 7.1.1.2.(2) 7.1.1.4.(6) 7.2.3.3.(1)
HC		Hazardous Products Act and its Regulations	4.2.3.2.(2)
HC		Workplace Hazardous Materials Information System (WHMIS) of the Hazardous Products Act	1.2.2.1.(1) Table 3.2.7.1
IMO		International Maritime Dangerous Goods Act	3.3.4.8.(1)
NFPA	10-1994	Portable Fire Extinguishers	3.2.4.5.(1) 6.2.1.1.(1) Table 6.2.3.3. Table 6.2.3.5. 6.2.4.1.(1)
NFPA	11-1994	Low Expansion Foam and Combined Agent Systems	4.3.2.5.(2) 6.8.1.1.(1)
NFPA	11A-1994	Medium and High Expansion Foam Systems	6.8.1.1.(1)
NFPA	12-1993	Carbon Dioxide Extinguishing Systems	6.8.1.1.(1)
NFPA	12A-1992	Halon 1301 Fire Extinguishing Systems	6.8.1.1.(1)
NFPA	12B-1990	Halon 1211 Fire Extinguishing Systems	6.8.1.1.(1)
NFPA	13-1996	Installation of Sprinkler Systems	3.2.3.3.(2)

Table 1.1.3.3. (Continued)

Issuing Agency	Document Number	Title of Document	Code Reference
NFPA	15-1996	Water Spray Fixed Systems for Fire Protection	4.3.2.5.(2) 6.8.1.1.(1)
NFPA	16-1995	Deluge Foam-Water Sprinkler and Foam-Water Spray Systems	6.8.1.1.(1)
NFPA	17-1994	Dry Chemical Extinguishing Systems	6.8.1.1.(1)
NFPA	17A-1994	Wet Chemical Extinguishing Systems	6.8.1.1.(1)
NFPA	18-1995	Wetting Agents	6.8.1.1.(1)
NFPA	25-1995	Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems	6.4.1.1.(1) 6.5.3.1.(1) 6.6.3.3.(6)
NFPA	30B-1994	Manufacture and Storage of Aerosol Products	3.2.5.2.(1) 3.2.5.5.(1)
NFPA	32-1996	Dry Cleaning Plants	5.6.2.1.(1)
NFPA	33-1995	Spray Application Using Flammable and Combustible Materials	5.4.2.1.(1)
NFPA	34-1995	Dipping and Coating Processes Using Flammable or Combustible Liquids	5.5.2.1.(1)
NFPA	37-1994	Installation and Use of Stationary Combustion Engines and Gas Turbines	4.3.12.2.(1)
NFPA	51-1992	Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting and Allied Processes	5.2.2.4.(1)
NFPA	68-1994	Venting of Deflagrations	3.2.8.2.(1) 4.2.9.6.(1) 4.3.13.3.(1) 4.8.3.2.(1) 4.8.4.2.(1) 5.3.1.6.(2) 5.6.1.5.(1)
NFPA	69-1992	Explosion Prevention Systems	4.3.2.5.(2) 4.8.4.2.(1) 5.3.1.7.(2)
NFPA	72-1996	National Fire Alarm Code	6.3.1.4.(1)
NFPA	80A-1996	Protection of Buildings from Exterior Fire Exposures	3.3.6.3.(2)
NFPA	82-1994	Incinerators, Waste and Linen Handling Systems and Equipment	2.6.2.2.(1)
NFPA	86-1995	Ovens and Furnaces	5.6.1.7.(1)
NFPA	91-1995	Exhaust Systems for Air-Conveying of Materials	3.2.2.3.(6) 5.3.1.3.(2) 5.3.2.1.(1) 5.7.4.3.(1)
NFPA	96-1994	Ventilation Control and Fire Protection of Commercial Cooking Equipment	2.6.1.9.(2)
NFPA	101®-1994	Life Safety Code®	2.7.1.5.(4)

### 1.1.3.3.

Table 1.1.3.3. (Continued)

Issuing Agency	Document Number	Title of Document	Code Reference
NFPA	231-1995	General Storage	3.2.1.1.(1) 3.2.2.4.(3) 3.2.3.3.(2) 3.2.3.3.(3)
NFPA	231C-1995	Rack Storage of Materials	3.2.3.3.(2) 3.2.3.3.(3)
NFPA	231D-1994	Storage of Rubber Tires	3.2.4.3.(1)
NFPA	505-1996	Powered Industrial Trucks	3.1.3.1.(1)
NFPA	664-1993	Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities	5.3.2.1.(1)
NFPA	701-1996	Fire Tests for Flame-Resistant Textiles and Films	2.3.2.2.(1) 2.9.2.1.(1)
NFPA	1231-1993	Water Supplies for Suburban and Rural Firefighting	3.3.2.16.(1)
NFPA	1962-1993	Care, Use and Service Testing of Fire Hose Including Connections and Nozzles	6.4.1.1.(4)
NFPA	2001-1996	Clean Agent Fire Extinguishing Systems	6.8.1.1.(1)
NFPA	NY-FPS-93	Fire Protection Systems: Inspection, Test, and Maintenance Manual, 2nd Edition	6.1.1.5.(2)
NRCan		Explosives Act and its Regulations	1.2.1.2.(1) 3.1.1.3.(1) 3.2.10.3.(2) 3.2.10.6.(1) 3.2.10.7.(1) 3.2.10.7.(2) 5.1.1.2.(1) 5.8.1.2.(1) 5.8.1.7.(1)
NRCan		Fireworks Manual	5.8.1.15.(1)
TC		Airport Regulations of the Aeronautics Act	2.13.1.1.(1)
TC		Transportation of Dangerous Goods Act and its Regulations (TDGR)	1.2.1.2.(1) 1.2.2.1.(1) 3.1.2.1.(1) 3.1.2.5.(1) Table 3.2.7.1. 3.2.7.1.(2)  3.2.7.14.(1) 3.2.7.14.(4) 3.2.7.15.(2) 3.3.4.1.(3) 4.1.1.1.(3) 4.2.3.1.(1)  4.2.3.2.(2) 4.6.4.7.(1) 5.8.1.2.(2) 6.2.4.6.(1)

Table 1.1.3.3. (Continued)

Issuing Agency	Document Number	Title of Document	Code Reference
TC	CTC 1977-3 RAIL	Pipe Crossings under Railways (No. E-10) Regulations	4.4.7.4.(3)
TC	CTC 1982-8 RAIL	Railway Prevention of Electric Sparks Regulations	4.6.4.5.(2) 4.7.5.1.(1)
TC	General Order No. O-32	Flammable Liquids Bulk Storage Regulations	4.4.7.4.(4) 4.6.2.2.(1) 4.6.4.1.(2)
ULC	C558-1975	Internal Combustion Engine-Powered Industrial Trucks	3.1.3.1.(2)
ULC	C583-1974	Electric Battery Powered Industrial Trucks	3.1.3.1.(3)
ULC	C842-M1984	Valves for Flammable and Combustible Liquids	4.4.8.1.(1)
ULC	C1275-1984	Storage Cabinets for Flammable Liquid Containers	4.2.10.5.(1)
ULC	CAN/ULC-S102-M88	Test for Surface Burning Characteristics of Building Materials and Assemblies	2.3.1.3.(3) 2.4.1.4.(2)
ULC	CAN/ULC-S109-M87	Flame Tests of Flame-Resistant Fabrics and Films	2.3.1.3.(2) 2.3.2.1.(1) 2.4.1.4.(2)
ULC	CAN/ULC-S503-M90	Carbon Dioxide Hand and Wheeled Fire Extinguishers	6.2.1.2.(1)
ULC	CAN/ULC-S504-M86	Dry Chemical and Dry Powder Hand and Wheeled Fire Extinguishers	6.2.1.2.(1)
ULC	CAN/ULC-S507-92	9 Litre Stored Pressure Water Type Fire Extinguishers	6.2.1.2.(1)
ULC	CAN/ULC-S508-M90	Rating and Fire Testing of Fire Extinguishers and Class D Extinguishing Media	6.2.2.2.(1)
ULC	CAN/ULC-S512-M87	Halogenated Agent Hand and Wheeled Fire Extinguishers	6.2.1.2.(1)
ULC	ULC-S513-1978	Threaded Hose Couplings for 1 1/2 and 2 1/2 inch Fire Hose	6.9.1.1.(3)
ULC	CAN/ULC-S524-M91	Installation of Fire Alarm Systems	6.3.1.7.(1)
ULC	CAN/ULC-S531-M87	Smoke Alarms	2.1.3.3.(1)
e ULC	ULC-S536-M96	Inspection and Testing of Fire Alarm Systems	6.1.1.5.(2) 6.3.1.2.(1) 6.3.1.7.(1)
e ULC	ULC-S537-M96	Verification of Fire Alarm Systems	6.1.1.5.(2) 6.3.1.7.(1)
ULC	CAN/ULC-S543-M84	Internal Lug, Quick Connect Couplings for Fire Hose	6.9.1.1.(4)
ULC	ULC-S601-93	Shop Fabricated Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids	4.3.1.2.(1)
ULC	CAN4-S601(A)-1991	Refurbishing of Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids	4.10.4.2.(3)
ULC	CAN/ULC-S602-M92	Aboveground Steel Tanks for Fuel Oil and Lubricating Oil	4.3.1.2.(1)
ULC	CAN/ULC-S603-92	Steel Underground Tanks for Flammable and Combustible Liquids	4.3.1.2.(1) 4.3.9.3.(1) 4.3.15.2.(5)

### 1.1.3.3.

**Table 1.1.3.3. (Continued)**

Issuing Agency	Document Number	Title of Document	Code Reference
ULC	CAN4-S603(A)-1992	Refurbishing of Steel Underground Tanks for Flammable and Combustible Liquids	4.10.4.2.(3)
ULC	CAN/ULC-S603.1-92	Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids	4.3.1.2.(1) 4.3.8.5.(1) 4.3.9.1.(1) 4.4.3.1.(2) 4.5.11.2.(1)
ULC	CAN/ULC-S612-M88	Hose for Flammable and Combustible Liquids	4.5.5.1.(1)
ULC	CAN4-S615-M83	Reinforced Plastic Underground Tanks for Petroleum Products	4.3.1.2.(1) 4.3.8.5.(2) 4.3.15.2.(5)
ULC	CAN/ULC-S620-M90	Hose Nozzle Valves for Flammable and Combustible Liquids	4.4.8.1.(2) 4.5.5.2.(1)
ULC	ULC-S630-93	Shop Fabricated Steel Aboveground Vertical Tanks for Flammable and Combustible Liquids	4.3.1.2.(1) 4.3.3.2.(1)
ULC	CAN4-S630(A)-1991	Shop Refurbishing of Steel Aboveground Vertical Tanks for Flammable and Combustible Liquids	4.10.4.2.(3)
ULC	CAN/ULC-S633-M90	Flexible Underground Hose Connectors for Flammable and Combustible Liquids	4.4.7.13.(2)
ULC	CAN/ULC-S642-M87	Compounds and Tapes for Threaded Pipe Joints	4.4.5.1.(1)
ULC	CAN/ULC-S643-M90	Shop Fabricated Steel Aboveground Utility Tanks for Flammable and Combustible Liquids	4.3.1.2.(1)
ULC	CAN/ULC-S644-M90	Emergency Breakaway Fittings for Flammable and Combustible Liquids	4.5.5.2.(4)
ULC	CAN/ULC-S651-M90	Emergency Valves for Flammable and Combustible Liquids	4.4.8.1.(3) 4.5.6.3.(1)
ULC	ULC-S652-93	Tank Assemblies for Collection of Used Oil	4.3.1.2.(1)
ULC	ULC-S653-94	Aboveground Steel Contained Tank Assemblies for Flammable and Combustible Liquids	4.3.1.2.(1)
ULC	ULC/ORD-C30-1995	Safety Containers	4.1.5.9.(2) 4.2.3.1.(1) 4.2.6.4.(1) 5.7.5.2.(2)
ULC	ULC/ORD-C58.9-1993	Secondary Containment Liners for Underground and Aboveground Flammable and Combustible Liquid Tanks	4.3.7.2.(2)
ULC	ULC/ORD-C58.10-1992	Jacketed Steel Underground Tanks for Flammable and Combustible Liquids	4.3.1.2.(1) 4.3.9.1.(2)
ULC	ULC/ORD-C58.12-1992	Leak Detection Devices (Volumetric Type) for Underground Flammable Liquid Storage Tanks	4.3.16.2.(1)
ULC	ULC/ORD-C58.14-1992	Nonvolumetric Leak Detection Devices for Underground Flammable Liquid Storage Tanks	4.3.16.2.(1)
ULC	ULC/ORD-C58.15-1992	Overfill Protection Devices for Flammable Liquid Storage Tanks	4.3.1.8.(1) 4.3.8.1.(6)

Table 1.1.3.3. (Continued)

Issuing Agency	Document Number	Title of Document	Code Reference
ULC	ULC/ORD-C58.19-1992	Spill Containment Devices for Underground Flammable Liquid Storage Tanks	4.3.8.1.(6)
ULC	ULC/ORD-C107.4-1992	Ducted Flexible Underground Piping Systems for Flammable and Combustible Liquids	4.4.2.1.(3)
ULC	ULC/ORD-C107.7-1993	Glass Fibre Reinforced Plastic Pipe and Fittings for Flammable and Combustible Liquids	4.4.2.1.(3)
ULC	ULC/ORD-C107.12-1992	Line Leak Detection Devices for Flammable Liquid Piping	4.4.6.7.(1)
ULC	ULC/ORD-C107.21-1992	Under Dispenser Sumps	4.3.8.1.(6) 4.3.8.1.(7) 4.5.3.1.(2)
ULC	ULC/ORD-C142.5-1992	Concrete Encased Steel Aboveground Tank Assemblies for Flammable and Combustible Liquids	4.3.1.2.(1)
ULC	ULC/ORD-C142.16-1994	Protected Aboveground Tank Assemblies for Flammable and Combustible Liquids	4.3.1.2.(1) 4.3.2.1.(7)
ULC	ULC/ORD-C142.18-1995	Rectangular Steel Aboveground Tanks for Flammable and Combustible Liquids	4.3.1.2.(1)
ULC	ULC/ORD-C142.22-1995	Contained Steel Vertical Aboveground Tank Assemblies for Flammable and Combustible Liquids	4.3.1.2.(1)
ULC	ULC/ORD-C142.23-1991	Aboveground Waste Oil Tanks	4.3.1.2.(1)
ULC	ULC/ORD-C410A-1994	Absorbents for Flammable and Combustible Liquids	4.1.6.3.(4)

## Section 1.2. Definitions

### 1.2.1. Terms

#### 1.2.1.1. Non-Defined Terms

1) Words and phrases that are not included in the list of definitions in Article 1.2.1.2. shall have the meanings which are commonly assigned to them in the context in which they are used in this Code, taking into account the specialized use of terms by the various trades and professions to which the terminology applies.

#### 1.2.1.2. Defined Terms

1) The words and terms used in this Code that are in italics have the following meanings:

*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*.

*Act* means the Safety Codes Act.

*Administrator* means an *Administrator* appointed under the Safety Codes Act.

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

*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.

*Approved* means acceptable to the *Administrator*, Fire Discipline.

*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.

*Atmospheric storage tank* means a *storage tank* designed to operate at pressures from atmospheric to 3.5 kPa (gauge).

## 1.2.1.2.

**Authority having jurisdiction** means a *safety codes officer* in the fire discipline exercising authority pursuant to designation of powers and terms of employment in accordance with Section 28 of the Safety Codes Act. (See Appendix A.)

**Basement** means a *storey* or *storeys* of a *building* located below the *first storey*.

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

**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 rendering or receiving of professional or personal services.

**Care or detention occupancy** (Group B) means the *occupancy* or use of a *building* or part thereof by persons who require special care or treatment because of cognitive or physical limitations or by persons who are restrained from, or are incapable of, self preservation because of security measures not under their control.

**Cathodic protection** or *cathodically protected* means a method of preventing corrosion to a metal surface by introducing another metal (anode) into the ground to create a corrosion cell in which the surface to be protected becomes a cathode. Deterioration or corrosion occurs at the anode (introduced metal). The *cathodic protection* may be of a sacrificial type or of an impressed current design.

**Chimney** means a primarily vertical shaft enclosing at least one *flue* for conducting *flue* gases to the outdoors.

**Class A fire** means a fire involving combustible materials such as wood, cloth and paper.

**Class B fire** means a fire involving a *flammable liquid* or *combustible liquid*, fat or grease.

**Class C fire** means a fire involving energized electrical equipment.

**Class D fire** means a fire involving a combustible metal.

**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, wired glass or glass block, and includes all components such as hardware, closing devices, frames and anchors.

**Combustible construction** means that type of construction that does not meet the requirements for *noncombustible construction*.

**Combustible dusts** means dusts and particles 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. (See Subsection 4.1.2.)

**Corrosive substance** means a solid, liquid or gas which when contacting living tissue damages the tissue, or when contacting other materials and certain chemicals, causes fire or accelerated deterioration of the material or chemical and includes substances defined as Class 8 dangerous goods in the Transportation of Dangerous Goods Act and its Regulations.

**Dangerous goods** means those products or substances which are regulated by the "Transportation of Dangerous Goods Act" and its Regulations. (See Table 3.2.7.1.)

**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.

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

**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 Appendix A.)

**Fire brigade** means an organized body at an industrial or institutional occupancy which has been assigned responsibility for fire protection by the employer.

**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*.

**Firecracker** means any device that explodes instantaneously when ignited and does not produce any subsequent display or visible effect after the explosion and, without restricting the generality of the foregoing, includes those devices commonly known as Chinese firecrackers, but does not include paper caps containing not more than 16.2 mg (1/4 grain) of explosive per cap or devices to be used with the paper caps.

**Fire damper** means a closure which consists of a damper installed in an air distribution system or a wall or floor assembly, which 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-protection rating** means the time in hours or fraction thereof 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 the Alberta Building Code.

**Fire-resistance rating** means the time in hours or fraction thereof 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 the Alberta Building Code.

**Fire separation** means a construction assembly that acts as a barrier against the spread of fire. (See Appendix A.)

**Fire stop flap** means a device intended for use in horizontal assemblies required to have a fire-resistance rating and incorporating protective ceiling membranes, which 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 which subdivides a building or separates adjoining buildings to resist the spread of fire and which 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.

**Fireworks** means the fireworks listed in Class 7, Division 1, and Class 7, Division 2, Subdivision 1 and 2 in Section 14 of the Explosives Act (Canada) and regulations under the Act.

**First storey** means the uppermost storey having its floor level not more than 2 m above grade.

**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 the Alberta Building 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 D 323, "Vapor Pressure of Petroleum Products (Reid Method)." (See Subsection 4.1.2.)

**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. (See Subsection 4.1.3.)

**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.

**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.

**Forest officer** means a person appointed as a forest officer pursuant to Section 2 of the Forests Act.

**Fuel dispensing station** means any premises at which flammable liquids or combustible liquids are dispensed from fixed equipment into the fuel tank of a motor vehicle, watercraft or aircraft.

**High hazard fireworks** means fireworks listed in Class 7, Division 2, Subdivision 2 in Section 14 of the Explosives Act (Canada) and its Regulations.

**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.

**Individual storage area** means the area occupied by piles, bin boxes, racks or shelves, including subsidiary aisles providing access to the stored products, which is separated from adjacent storage by aisles not less than 2.4 m in width. (See Appendix A.)

**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.

**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.

## 1.2.1.2.

**Keylock installation** means a *self-service outlet* that

- (a) is equipped with dispensing devices that do not display the price of the fuel being dispensed, and
- (b) is for the exclusive use of persons who are under contract with a supplier for the specified quantity of fuel over a specified period of time.

**Labelled** means equipment or materials to which has been attached a label, symbol or other identifying mark indicating that it has been manufactured under a certification programme administered by an accredited Certification Organization or Standards Writing Organization under the National Standards System of Canada.

**Listed** means equipment or materials included in a list published by an accredited Certification Organization or Standards Writing Organization under the National Standards System of Canada.

**Low hazard fireworks** means *fireworks* listed in Class 7, Division 1 and Class 7, Division 2, Subdivision 1 in Section 14 of the Explosives Act (Canada) and regulations under the Act.

**Low hazard industrial occupancy** (Group F, Division 3) means an *industrial occupancy* in which the combustible content is not more than 50 kg/m<sup>2</sup> or 1 200 MJ/m<sup>2</sup> of floor area.

**Low pressure storage tank** means a *storage tank* designed to operate at pressures greater than 3.5 kPa (gauge) to 100 kPa (gauge).

**Lower explosive limit** means the minimum concentration of vapour in air at which the propagation of flame occurs on contact with a source of ignition.

**Major occupancy** means the principal *occupancy* for which a *building* or a part thereof is used or intended to be used, and shall be deemed to include the subsidiary *occupancies* which are an integral part of the principal *occupancy*.

**Marine fuel dispensing station** means a *fuel dispensing station* at which *flammable liquids* or *combustible liquids* are put into the fuel tanks of watercraft or aircraft.

**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*.

**Medium hazard industrial occupancy** (Group F, Division 2) means an *industrial occupancy* in which the combustible content is more than 50 kg/m<sup>2</sup> or 1 200 MJ/m<sup>2</sup> of floor area and not classified as *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.

**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*.

**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 maximum number of persons that may occupy a *building* or an area of a *building* at one time.

**Overfill protection device** means a device or combination of components that is installed in a *storage tank*, fill tube or vent that prevents a *storage tank* from being overfilled when product is being delivered to the *storage tank*.

**Owner** includes a leasee, a person in charge, a person who has care and control and a person who holds himself out as having powers and authority of ownership or who for the time being exercises the powers and authority of ownership.

**Oxidizing substance** means a product or substance that causes or contributes to the combustion of other material by yielding oxygen or other *oxidizing substances* whether or not the product is itself combustible.

**Partition** means an interior wall 1 *storey* or part-*storey* in height that is not loadbearing.

**Pressure vessel** means a *storage tank* designed to operate at pressures greater than 100 kPa (gauge).

**Process plant** means an *industrial occupancy* where materials, including *flammable liquids*, *combustible liquids* or Class 2 gases, are produced or used in a process. (See Table 3.2.7.1.)

**Rack** means any combination of vertical, horizontal or diagonal members that support stored materials on solid or open shelves, including both fixed and portable units.

**Refinery** means any *process plant* in which *flammable liquids* or *combustible liquids* are produced from crude petroleum, including areas on the same site where the resulting products are blended, packaged or stored on a commercial scale.

**Residential occupancy** (Group C) means the *occupancy* or use of a *building* or part thereof by persons for whom sleeping accommodation is provided but who are not harboured or detained to receive medical care or treatment or are not involuntarily detained.

**Safety codes officer** means an individual designated as a *safety codes officer* under Section 27 of the *Act*.

**Secondary containment** means containment which prevents any materials spilled or leaked from the primary *storage tank system* from reaching the

land or water outside the containment area before cleanup occurs and includes double wall *storage tank systems* and impermeable membranes or liners.

*Self-service outlet* means a *fuel dispensing station* other than a *marine fuel dispensing station* where the public handles the dispenser.

*Service room* means a room provided in a *building* to contain equipment associated with *building services*. (See Appendix A.)

*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.

*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 pre-determined level.

*Spill containment device* means a liquid tight container fitted to the fill inlet of a *storage tank* which is intended to catch, retain and drain any product spilled at the time of filling.

*Sprinklered* (as applying to a *building* or part thereof) means that the *building* or part thereof is equipped with a system of automatic sprinklers.

*Stickered lumber piles* means lumber stacks with sticks or strips installed between boards or sheets to hasten drying or reduce warping.

*Storage garage* means a *building* or part thereof intended for the storage or parking of motor vehicles and which contains no provision for the repair or servicing of such vehicles.

*Storage tank* means a vessel for *flammable liquids* or *combustible liquids* having a capacity of more than 230 L, and designed to be installed in a fixed location.

*Storage tank system* means a system for the storage and dispensing of *flammable liquids* and *combustible liquids* and is not limited to *storage tanks*, associated piping, vents, pumps, and dispensing equipment.

*Storey* means that portion of a *building* which is situated between the top of any floor and the top of the floor next above it, and if there is no floor above it, that portion between the top of such floor and the ceiling above it.

*Street* means any highway, road, boulevard, square or other improved thoroughfare 9 m or more in width, which has been dedicated or deeded for

public use, and is accessible to fire department vehicles and equipment.

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

*Supervisory staff* means those occupants of a *building* who have some delegated responsibility for the fire safety of other occupants under the fire safety plan.

*Tank vehicle* means any vehicle, other than railroad tank cars and boats, with a cargo tank having a capacity of more than 450 L, mounted or built as an integral part of the vehicle and used for the transportation of *flammable liquids* or *combustible liquids* and including tank trucks, trailers and semi-trailers.

*Underground storage tank system* means a system for storing and dispensing *flammable liquids* or *combustible liquids* including one or more *storage tanks*, installed at least partially underground, and all piping, pumps and dispensing equipment connected to the system.

*Unstable liquid* means a liquid, including *flammable liquids* and *combustible liquids*, which is chemically reactive to the extent that it will vigorously react or decompose at or near normal temperature and pressure conditions or which is chemically unstable when subject to impact.

*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.

## 1.2.2. Abbreviations and Symbols

### 1.2.2.1. Abbreviations of Proper Names

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

AAFC.....Agriculture and Agri-Food Canada  
(Sir John Carling Building, 930  
Carling Avenue, Ottawa, Ontario  
K1A 0C5)

ACGIH.....American Conference of  
Governmental Industrial Hygienists  
(1330 Kemper Meadow Drive,  
Cincinnati, Ohio 45240 U.S.A.)

## 1.2.2.1.

AECB.....	Atomic Energy Control Board (280 Slater Street, P.O. Box 1046, Station B, Ottawa, Ontario K1P 5S9)	FMEC.....	Factory Mutual Engineering Corporation (1151 Boston-Providence Turnpike, P.O. Box 9102, Norwood, Massachusetts 02062 U.S.A.)
ANSI.....	American National Standards Institute (11 West 42nd Street, 13th Floor, New York, New York 10036 U.S.A.)	HC.....	Health Canada (Communications Directorate, Ottawa, Ontario K1A 0K9)
API.....	American Petroleum Institute (1220 L Street NW, Washington, D.C. 20005 U.S.A.)	IAO.....	Insurers' Advisory Organization Inc. (18 King Street East, Suite 700, Toronto, Ontario M5C 1C4)
ASME.....	American Society of Mechanical Engineers (22 Law Drive, Fairfield, New Jersey 07007 U.S.A.)	ICAO.....	International Civil Aviation Organization (1000 Sherbrooke Street West, Montreal, Quebec H3A 2R2)
ASTM.....	American Society for Testing and Materials (100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428-2959 U.S.A.)	IMO.....	International Maritime Organization (4 Albert Embankment, London, SE1 7SR United Kingdom)
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.)	IRC.....	Institute for Research in Construction (National Research Council of Canada, Ottawa, Ontario K1A 0R6)
CCBFC.....	Canadian Commission on Building and Fire Codes (National Research Council of Canada, Ottawa, Ontario K1A 0R6)	IRI.....	Industrial Risk Insurers (85 Woodland Street, Hartford, Connecticut 06102-5010 U.S.A.)
CGA.....	Canadian Gas Association (International Approval Services Canada Inc., 55 Scarsdale Road, Don Mills, Ontario M3B 2R3)	NBC.....	National Building Code of Canada 1995 (see CCBFC)
CGAI.....	The Compressed Gas Association Incorporated (1725 Jefferson Davis Highway, Suite 1004, Arlington, Virginia 22202-4102 U.S.A.)	NFC.....	National Fire Code of Canada 1995 (see CCBFC)
CGSB.....	Canadian General Standards Board (Place du Portage, Phase III, 6B1, 11 Laurier Street, Hull, Quebec K1A 1G6)	NFPA.....	National Fire Protection Association (Batterymarch Park, Quincy, Massachusetts 02269 U.S.A.)
CPPI.....	Canadian Petroleum Products Institute (275 Slater Street, Suite 1000, Ottawa, Ontario K1P 5H9)	NRC.....	National Research Council of Canada (Ottawa, Ontario K1A 0R6)
CSA.....	Canadian Standards Association (178 Rexdale Boulevard, Etobicoke, Ontario M9W 1R3)	NRCan.....	Natural Resources Canada (580 Booth Street, Ottawa, Ontario K1A 0E4)
ERCB.....	Energy and Resources Conservation Board (see EUB)	OCIMF.....	Oil Companies International Marine Forum (96 Victoria Street, 15th Floor, London, SW1E 5JW United Kingdom)
EUB.....	Alberta Energy and Utilities Board (formerly ERCB) (640 - 5th Street, S.W., Calgary, Alberta, T2P 3G4)	PTMAA.....	Petroleum Tank Management Association of Alberta (Suite 1560, 10303 Jasper Avenue, Edmonton, Alberta T5J 3N6)
		RMA.....	The Rubber Manufacturers Association, Inc. (1400 K Street N.W., Suite 900, Washington, D.C. 20005 U.S.A.)
		TC.....	Transport Canada (Public Affairs, Tower C, Place de Ville, 330 Sparks Street, 28th Floor, Ottawa K1A 0N5)

TDGR.....	Transportation of Dangerous Goods Regulations (see TC)
UL.....	Underwriters Laboratories Inc. (1285 Walt Whitman Road, Melville, New York, New York 11747-3081 U.S.A.)
ULC.....	Underwriters' Laboratories of Canada (7 Crouse Road, Scarborough, Ontario M1R 3A9)
UN.....	United Nations (United Nations Plaza, New York, New York 10017 U.S.A.)
WHMIS.....	Workplace Hazardous Materials Information System (see also HC) (Occupational Health and Safety, 902, Labour Building, 10808 - 99 Avenue, Edmonton, Alberta T5K 0G5)

### 1.2.2.2. Symbols and Other Abbreviations

**1)** Symbols and other abbreviations in this Code shall have the meanings assigned to them in this Article.

cm.....	centimetre(s)
°C.....	degree(s) Celsius
h.....	hour(s)
kg.....	kilogram(s)
kPa.....	kilopascal(s)
L.....	litre(s)
m.....	metre(s)
max. ....	maximum
min. ....	minimum
min.....	minute(s)
MJ.....	megajoule(s)
mL.....	millilitre(s)
mm.....	millimetre(s)
mm <sup>2</sup> /s.....	centistoke(s)
N/A.....	not applicable
No. ....	number(s)
pS/m.....	pico Siemens per metre
s.....	second(s)
>.....	greater than
xx <sup>2</sup> .....	squared unit
xx <sup>3</sup> .....	cubic unit
≤.....	less than or equal to
/ .....	per
%.....	per cent



# Part 2

## Building and Occupant Fire Safety

### Section 2.1. General

#### 2.1.1. Scope

##### 2.1.1.1. Application

1) This Part provides for the safety of the occupants in existing *buildings*, the elimination or control of fire hazards in and around *buildings*, the installation and maintenance of certain life safety systems in *buildings*, the installation and maintenance of posted signs and information, and the establishing of a fire safety plan in those *occupancies* where it is considered necessary.

#### 2.1.2. Classification of Buildings

##### 2.1.2.1. Classification

1) For the purpose of applying this Code, every *building* or part thereof shall be classified according to its *major occupancy* in conformance with the Alberta Building Code. (See Appendix A.)

##### 2.1.2.2. Hazardous Activities

1) Activities which, in the opinion of the *authority having jurisdiction*, create a hazard and which are not allowed for in the original design shall not be carried out in a *building* unless provisions are made to alleviate the hazard and permission is obtained in writing from the *authority having jurisdiction* to carry out such activities. (See Appendix A.)

2) No *major occupancy* of Group F, Division 1 shall be contained within a *building* with any *occupancy* classified as an *assembly, care or detention* or *residential occupancy*.

#### 2.1.3. Fire Safety Installations

##### 2.1.3.1. Fire Alarm, Standpipe and Sprinkler Systems

1) Except as provided in Article 1.1.2.3., fire alarm, standpipe and sprinkler systems shall be provided in all *buildings* where required by and in conformance with the Alberta Building Code, and regulations made pursuant to the Safety Codes Act. (See Appendix A.)

2) When changes in the use of *buildings* or *floor areas* create a hazard exceeding the criteria for which the fire protection systems were designed, such fire protection systems shall be upgraded to accommodate the increased hazard.

3) If a fire alarm system was installed in a *building* or part of a *building* before the effective date of this Code, the *authority having jurisdiction* may permit the fire alarm system to remain in operation.

##### 2.1.3.2. Voice Communication Systems

1) Except as provided in Article 1.1.2.3., a voice communication system or systems integrated with the general fire alarm system shall be provided in *buildings* as specified in Subsection 3.2.6. of the Alberta Building Code, the Safety Codes Act and its Regulations.

##### 2.1.3.3. Smoke Alarms

1) *Smoke alarms* conforming to CAN/ULC-S531-M, "Smoke Alarms," shall be installed in each *dwelling unit* and, except for *care or detention occupancies* required to have a fire alarm system, in each sleeping room not within a *dwelling unit*.

2) *Smoke alarms* within *dwelling units* shall be installed between each sleeping area and the remainder of the *dwelling unit*, and where the sleeping areas are served by hallways, the *smoke alarms* shall be installed in the hallways.

3) Except as permitted by Sentence (4), *smoke alarms* shall be installed, inspected, tested and maintained in conformance with the manufacturer's instructions and the Alberta Building Code.

4) *Smoke alarms* are permitted to be battery operated in houses, including semi-detached houses, duplexes, triplexes, town houses, row houses and boarding houses constructed prior to July 5, 1977. (See Appendix A.)

#### 2.1.4. Posted Information

##### 2.1.4.1. Posting

1) Where a sign, notice, placard or information is required to be posted, it shall be  
a) clearly legible, and

## 2.1.4.2.

- b) except as provided in Sentence (2), permanently mounted in a conspicuous or prominent location in proximity to the situation to which it refers.

2) Where the situation for which posting is required is of a temporary nature, permanent mounting need not be provided.

### 2.1.4.2. Maintenance

1) Every sign, notice, placard or information that is required to be posted shall be maintained in conformance with Article 2.1.4.1.

## Section 2.2. Fire Separations

### 2.2.1. General

#### 2.2.1.1. Fire Separations

1) Except as provided in Article 1.1.2.3., where a *building* contains more than one *major occupancy*, such *occupancies* shall be separated from each other in conformance with the Alberta Building Code.

2) Where rooms or spaces within a *building* contain a *high hazard industrial occupancy*, such *occupancy* shall be separated from the remainder of the *building* by *fire separations* in conformance with this Code and the Alberta Building Code.

3) Except as provided in Article 1.1.2.3., rooms, corridors, shafts and other spaces shall be separated where practicable by *fire separations* conforming to the Alberta Building Code.

#### 2.2.1.2. Damage to Fire Separations

1) Where *fire separations* are damaged so as to affect their integrity, they shall be repaired so that the integrity of the *fire separation* is maintained in conformance with the Alberta Building Code.

### 2.2.2. Closures

#### 2.2.2.1. Openings in Fire Separations

1) Except as provided in Article 1.1.2.3., openings in *fire separations* shall be protected with *closures* in conformance with the Alberta Building Code.

2) Where *closures* in *fire separations* are replaced, the replacements shall be in conformance with the Alberta Building Code.

#### 2.2.2.2. Damage to Closures

1) Where *closures* are damaged so as to affect the integrity of their *fire-protection rating*, such damaged *closures* shall be repaired so that the

integrity of the *closures* is maintained in conformance with Article 2.2.2.1.

### 2.2.2.3. Protective Guarding Devices

- 1) Protective guarding devices shall be
  - a) provided where necessary to prevent damage to the mechanical components of doors in *fire separations*, and
  - b) installed so as not to interfere with the proper operation of the doors.

### 2.2.2.4. Inspection and Maintenance

1) Defects that interfere with the operation of *closures* in *fire separations* shall be corrected, and such *closures* shall be maintained to ensure that they are operable at all times by

- a) keeping fusible links and other heat-actuated devices undamaged and free of paint and dirt,
- b) keeping guides, bearings and stay rolls clean and lubricated,
- c) making necessary adjustments and repairs to door hardware and accessories to ensure proper closing and latching, and
- d) repairing or replacing inoperative parts of hold-open devices and automatic releasing devices.

2) Doors in *fire separations* shall be inspected at intervals not greater than 24 h to ensure that they remain closed unless the door is equipped with a hold-open device conforming to the Alberta Building Code.

3) Doors in *fire separations* shall be operated at intervals not greater than one month to ensure that they are properly maintained in accordance with Sentence (1), as specified in the fire safety plan prepared in conformance with Section 2.8.

4) *Closures* in *fire separations* shall not be obstructed or altered in any way that would prevent the normal operation of the *closure*.

5) *Fire dampers* and *fire stop flaps* shall be inspected at intervals not greater than 12 months to ensure that they are in place and are not obviously damaged or obstructed.

## Section 2.3. Interior Finishing, Furnishing and Decorative Materials

### 2.3.1. General

#### 2.3.1.1. Interior Finish

1) Except as provided in Article 1.1.2.3., interior finish material that forms part of the interior surface

of a floor, wall, *partition* or ceiling shall conform to the Alberta Building Code.

#### 2.3.1.2. Movable Partitions and Screens

1) Movable *partitions* or screens, including acoustical screens, shall have a *flame-spread rating* not greater than that required for the interior finish of the area in which they are located.

#### 2.3.1.3. Decorative Materials

1) Except as provided in Sentences (2) and (3), decorative materials on walls or ceilings of occupancies shall have a *flame-spread rating* not greater than that required for the interior finish of the space in which they are located.

2) In Group A and Group B occupancies, combustible materials used for festive decorations, including but not limited to crepe paper decorations, other combustible trimming or ornaments and Christmas trees, shall be of the flame-resistant type, or conform to CAN/ULC-S109M, "Flame Tests of Flame-Resistant Fabrics and Films." (See Appendix A.)

3) Combustible materials, such as student artwork and teaching aids attached to school classroom and *access to exits* walls and ceilings shall not exceed 20% of a wall or ceiling surface unless

- a) the combustible materials have been tested to CAN/ULC-S102-M88, "Standard Method of Tests for Surface Burning Characteristics of Building Materials and Assemblies," and
- b) the *flame-spread rating* does not exceed that required for the interior finish of the space in which they are located.

#### 2.3.1.4. Interconnected Floor Spaces

1) Combustible contents in *interconnected floor spaces* in which the ceiling is more than 8 m above the floor, shall not exceed the limit specified in Subsection 3.2.8. of the Alberta Building Code.

#### 2.3.1.5. Combustible Display or Exhibit

1) No person shall operate or install a combustible display or exhibit in a Group A, Division 1, 2 or 3 *occupancy* unless the *building* is protected by an automatic sprinkler system designed and installed in conformance with the Alberta Building Code or until precautions have been taken to protect the occupants from the hazards of fire. (See A-2.1.2.2.(1) in Appendix A.)

2) An arena type *building* intended for occasional use for trade shows and similar exhibition purposes shall be classified in accordance with the Alberta Building Code.

### 2.3.2. Flame Resistance

#### 2.3.2.1. Drapes, Curtains and Decorative Materials

1) Drapes, curtains and other decorative materials including textiles and films used in *buildings* shall conform to CAN/ULC-S109-M, "Flame Tests of Flame-Resistant Fabrics and Films" when such drapes, curtains and other decorative materials are used in

- a) any *assembly occupancy* or Group B, Division 1 *care or detention occupancy*,
- b) any lobby or *exit*, or
- c) any open *floor areas* exceeding 500 m<sup>2</sup> in any *business and personal services*, *mercantile* or *industrial occupancy*, except when the *floor area* is divided into *fire compartments* not exceeding 500 m<sup>2</sup> in area and separated from the remainder of the *floor area* by *fire separations* having at least a 1 h *fire-resistance rating*.

#### 2.3.2.2. Flame Retardant Treatments

1) Flame retardant treatments shall be renewed as often as required to ensure that the material will pass the match flame test in NFPA 701, "Fire Tests for Flame-Resistant Textiles and Films." (See Appendix A.)

2) A written record of tests and flameproofing treatment carried out shall be maintained by the *owner* in accordance with Article 1.1.1.2.

#### 2.3.2.3. Hospital Textiles

1) Mattresses, bed linen, window drapes and cubicle curtains used in Group B, Division 2 *care or detention occupancies* shall conform to CAN/CGSB-4.162-M, "Hospital Textiles – Flammability Performance Requirements."

## Section 2.4. Fire Hazards

### 2.4.1. Combustible Materials

#### 2.4.1.1. Accumulation of Combustible Materials

1) Combustible waste materials in and around *buildings* shall not be permitted to accumulate in quantities or locations that will constitute an undue fire hazard. (See Appendix A.)

2) Combustible materials, other than those for which the location, room or space is designed, shall not be permitted to accumulate in any part of an elevator shaft, ventilation shaft, *means of egress*, *service room* or *service space*. (See Appendix A.)

## 2.4.1.2.

3) Horizontal concealed spaces, such as crawl spaces and ceiling spaces, shall not be used for the storage of combustible materials.

4) Combustible materials shall not be stored on a roof or adjacent to any *building* so as to create a fire hazard to the *building* or its occupants.

5) Unless acceptable to the *authority having jurisdiction*, outdoor storage receptacles for combustible materials shall be located no less than 3 m from combustible *buildings* and be fitted with a cover that shall remain closed except when the receptacle is being filled or emptied. (See Appendix A.)

### 2.4.1.2. Storage Rooms for Combustible Waste Materials

1) Except as provided in Article 1.1.2.3., where rooms are provided for the storage of combustible waste materials, such rooms shall conform to the Alberta Building Code.

### 2.4.1.3. Use of Waste Receptacles

1) Greasy or oily rags or materials subject to spontaneous ignition shall be deposited in a receptacle conforming to Sentence (4) or be removed from the premises.

2) All ashes shall be stored in receptacles conforming to Sentence (4) and combustible materials shall not be stored with ashes in the same container.

3) Except as permitted in Sentence (4), receptacles as required in Sentences (1) and (2) shall not be placed closer than 1 m to combustible materials.

4) A receptacle required in accordance with Sentences (1) and (2) shall be *listed* and *labelled*, or

- be constructed of metal,
- have a close-fitting metal cover, and
- if the flooring material upon which it is placed is combustible, have a flanged bottom or legs not less than 50 mm high.

### 2.4.1.4. Receptacles for Combustible Recyclable Material

1) Except as permitted in Sentence (2), receptacles for combustible recyclable material having a capacity greater than 0.125 m<sup>3</sup> used within a *building* shall be

- of fully enclosed *noncombustible construction* with a tight fitting lid, or
- located in a storage room conforming to Article 2.4.1.5.

2) Receptacles conforming to CAN/ULC-S102-M88, "Standard Method of Test for Surface Burning Characteristics of Building

Materials and Assemblies," and tested in conformance with CAN/ULC-S109-M, "Flame Tests of Flame Resistant Fabrics and Films," are permitted for the collection of combustible recyclable materials.

3) Unless acceptable to the *authority having jurisdiction*, only one receptacle for combustible recyclable materials per *suite* shall be permitted.

4) Receptacles for combustible recyclable material shall be emptied when full or at least weekly.

5) Receptacles for combustible recyclable material shall not be placed in rooms or areas where smoking is permitted unless the receptacles are of non-combustible construction with a tight fitting lid. (See Appendix A.)

### 2.4.1.5. Storage Rooms for Combustible Recyclable Materials

1) Where rooms are provided to facilitate central collection of combustible recyclable material, such rooms shall conform to the combustible refuse storage requirements of the Alberta Building Code.

### 2.4.1.6. Lint Traps for Laundry Equipment

1) Lint traps, vents and associated piping in laundry equipment shall be cleaned at intervals frequent enough to prevent the lint accumulating in quantities which will constitute a hazard.

## 2.4.2. Smoking

### 2.4.2.1. Smoking Areas

1) Smoking shall not be permitted in areas where conditions are such as to make smoking a fire or explosion hazard.

2) An area where smoking is not permitted in Sentence (1) shall be identified by signs conforming to Article 2.4.2.2.

3) Where smoking is permitted, an adequate number of ash trays shall be provided.

### 2.4.2.2. Signs

1) Signs prohibiting smoking shall have black lettering not less than 50 mm high with a 12 mm stroke on a yellow background, except that symbols of not less than 150 mm by 150 mm are permitted to be used in lieu of lettering.

## 2.4.3. Open Flames

### 2.4.3.1. Open Flames in Processions

1) Unless acceptable to the *authority having jurisdiction*, open flames whose quantity and

method of use create a fire hazard shall not be permitted in processions, at displays, or as part of an act or entertainment

- a) in areas and *buildings* used for public assembly, or
- b) in dining areas in Group B, Division 2 *care or detention occupancies*.

#### 2.4.3.2. Flaming Meals and Drinks

1) In Group B, Division 2 *care or detention occupancies*, flaming meals or drinks shall not be served.

2) In *assembly occupancies*, flaming meals or drinks shall be ignited only at the location of serving.

3) Refuelling of equipment used for flaming meals or drinks or for warming food shall be carried out

- a) outside the serving area, and
- b) away from ignition sources.

#### 2.4.3.3. Portable Extinguishers

1) A portable extinguisher with a minimum rating of 5-B:C shall be located on the serving cart or table where flaming meals and drinks are being served.

#### 2.4.3.4. Devices Having Open Flames

1) Devices having open flames shall be securely supported in noncombustible holders and shall be located or protected so as to prevent accidental contact of the flame with combustible materials.

### 2.4.4. Use of Dangerous Goods

#### 2.4.4.1. Flammable and Combustible Liquids

1) *Flammable liquids* and *combustible liquids* shall be classified, stored and handled in conformance with Part 4.

2) Class 1 liquids shall not be used for cleaning purposes except where such cleaning is an essential part of a process.

3) Spills of *flammable liquids* or *combustible liquids* within *buildings* shall be removed in conformance with Subsection 4.1.6.

#### 2.4.4.2. Flammable Gases

1) Class 2.1 flammable gases shall not be used to inflate balloons.

#### 2.4.4.3. Internal Combustion Powered Equipment

1) Unless acceptable to the *authority having jurisdiction*, equipment utilizing an internal combustion engine shall be stored in a *storage garage*.

#### 2.4.4.4. Emergency Shutoff Valves in Schools

1) The person in charge of a school shall ensure that the emergency shutoff valves that control multiple gas outlets that are not equipped with automatic shutoff valves are in the closed position when the gas outlets are not in use.

#### 2.4.4.5. Propane Fuelled Vehicles

1) Except as permitted in Sentence (2), only a propane fuelled vehicle labelled in accordance with the CAN/CGA-B149.5, "Installation Code for Propane Fuelled Systems and Tanks on Highway Vehicles" may enter or be parked in

- a) an underground parking facility, or
- b) an enclosed structure.

(See Appendix A.)

2) A propane fuelled vehicle may be parked in an enclosed structure where it is

- a) a garage serving not more than one *dwelling unit*, or
- b) not used by the public and is acceptable to the *authority having jurisdiction*.

3) No person shall park a propane fuelled vehicle inside a *building* for repair or maintenance unless safety precautions are taken in conformance with the Safety Codes Act and its Regulations.

#### 2.4.4.6. Gas Containers

1) No person shall store or use a natural gas or liquefied petroleum gas container for use with fuel burning *appliances* or equipment except in conformance with the Safety Codes Act and its Regulations.

### 2.4.5. Open Air Fires

#### 2.4.5.1. Open Air Fires

1) Except for fires used for cooking in fireplaces, grills or barbecues, open air fires shall not be set unless appropriate measures are taken to limit their spread. (See Appendix A.)

2) No person shall use a solid fuel fired barbecue in a *building* or on the balcony of a *building* containing more than 2 *dwelling units*.

## 2.4.6.1.

### 2.4.6. Vacant Buildings

#### 2.4.6.1. Security

1) Vacant *buildings* shall be secured against unauthorized entry. (See Appendix A.)

### 2.4.7. Electrical Installations

#### 2.4.7.1. Use and Maintenance

1) Electrical installations shall be used and maintained so as not to constitute an undue fire hazard.

## Section 2.5. Fire Department Access to Buildings

### 2.5.1. General

#### 2.5.1.1. Access to Building

1) Except as provided in Article 1.1.2.3., fire department vehicles shall have direct access to at least one face of every *building* by means of a *street*, yard or roadway in conformance with the Alberta Building Code.

#### 2.5.1.2. Access Panels and Windows

1) Access panels or windows provided to facilitate access for fire fighting operations shall be maintained free of obstruction.

#### 2.5.1.3. Fire Department Key Box

1) A fire department key box constructed, keyed, and located in a manner acceptable to the *authority having jurisdiction* shall be provided in a *building*, and shall contain a set or sets of keys or devices required to be used in an emergency.

2) A fire department key box shall be installed and provided with keys and devices in conformance with Sentence (1) in a *building* equipped with

- a fire alarm system where control features, including those for emergency voice communication systems, are located behind a locked panel,
- a fire alarm system where manually operated devices require a key or device in order to be reset,
- a fire alarm system where the electrical circuit breaker is located within a locked panel or room,
- an automatic sprinkler system where the main control valve is locked in the open position,

- an automatic sprinkler system where the main control valve is located within a locked room or enclosure,
- fire fighting standpipe and water supply connections in a locked room or area such as on a roof,
- a key operated elevator control feature that will permit exclusive use of elevators to fire fighting personnel only,
- a key operated elevator control feature that will switch selected elevators to operate on emergency power,
- stairway doors that have been locked on the stairway side in conformance with the Alberta Building Code, or
- locked access doors to a roof provided for fire fighting purposes.

3) Keys or devices provided in conformance with Sentence (2) shall be affixed to a key ring or rings, and identified with tags indicating their function.

4) When a fire alarm system or sprinkler system is required to transmit a signal to the fire department in conformance with the Alberta Building Code, a key box shall be installed on the exterior wall of the *building* in proximity to the principal entrance.

5) A key box installed in conformance with Sentence (4) shall contain an entrance door key with a tag affixed to this key in conformance with Sentence (3).

#### 2.5.1.4. Access to Fire Department Connections

1) Access to fire department connections for sprinkler or standpipe systems by fire fighters and their equipment shall be maintained free of obstructions at all times.

#### 2.5.1.5. Maintenance of Fire Department Access

1) *Streets*, yards and roadways provided for fire department access shall be maintained so as to be ready for use at all times by fire department vehicles.

2) Vehicles shall not be parked to obstruct access by fire department vehicles and signs shall be posted prohibiting such parking. (See Appendix A.)

3) Signs posted in conformance with Sentence (2) shall be permanently installed no more than 20 m apart and not more than 2.3 m above surrounding grade to ensure they are clearly visible to approaching vehicles.

## Section 2.6. Service Equipment

### 2.6.1. Heating, Ventilating and Air-Conditioning

#### 2.6.1.1. Installation

1) Heating, ventilating and air-conditioning *appliances* and equipment shall be installed in conformance with the Alberta Building Code and the Safety Codes Act and its Regulations.

#### 2.6.1.2. Coal and Wood Bins

1) Coal and wood bins shall be located not less than 1.2 m from the *appliance* served.

#### 2.6.1.3. Hoods, Ducts and Filters

1) Hoods, ducts and filters subject to accumulations of combustible deposits shall be inspected at intervals not greater than 7 days, and shall be cleaned if the accumulation of such deposits creates a fire hazard.

#### 2.6.1.4. Chimneys, Flues and Flue Pipes

1) Every *chimney*, *flue* and *flue pipe* shall be inspected to identify any dangerous condition

- at intervals not greater than 12 months,
- at the time of addition of any *appliance*, and
- after any *chimney* fire.

(See Appendix A.)

2) *Chimneys*, *flues* and *flue pipes* shall be cleaned as often as necessary to keep them free from dangerous accumulations of combustible deposits. (See Appendix A.)

3) A *chimney*, *flue*, or *flue pipe* shall be replaced or repaired to eliminate

- any structural deficiency or decay (see Appendix A), and
- all abandoned or unused openings which are not effectively sealed in a manner that would prevent the passage of fire or smoke.

#### 2.6.1.5. Clearances

1) Required clearances between *chimneys*, *flue pipes* or *appliances* and *combustible construction* shall be maintained in conformance with the Alberta Building Code.

2) Combustible materials shall not be located within the required clearance space surrounding *chimneys*, *flue pipes* or *appliances*, or adjacent to ash pit or cleanout doors.

#### 2.6.1.6. Operation and Maintenance Procedures

1) Heating, ventilating and air-conditioning systems, including *appliances*, *chimneys* and *flue pipes*, shall be operated and maintained so as not to create a hazardous condition.

2) Except for self-contained systems within *dwelling units*, disconnect switches for mechanical air-conditioning and ventilating systems shall be operated at intervals not greater than 12 months to establish that the system can be shut down in an emergency.

3) A record shall be kept of the tests required by Sentence (2) and such records shall be retained for examination by the *authority having jurisdiction* in conformance with Article 1.1.1.2.

#### 2.6.1.7. Ventilation Shafts

1) Ventilation shafts shall be used only for ventilating purposes.

#### 2.6.1.8. Repairs and Renovations

1) Work on ducts involving the use of heat producing devices for cutting, welding or soldering shall not be undertaken before

- the system has been shut down,
- the duct has been cleaned of any accumulations of combustible deposits, and
- any combustible lining and covering material that could be ignited by such work has been removed.

2) Precautions shall be taken, where necessary, to ensure that there is no damage to fuel supply piping or equipment that would result in fuel leakage or a fire hazard during renovations or excavation.

#### 2.6.1.9. Commercial Cooking Equipment

1) Except as provided in Article 1.1.2.3., commercial cooking equipment exhaust and fire protection systems shall be designed and installed in conformance with the Alberta Building Code.

2) Except as provided in Article 1.1.2.3. and Sentences (3) to (5), the use, inspection and maintenance of commercial cooking equipment exhaust and fire protection systems shall be in conformance with NFPA 96, "Ventilation Control and Fire Protection of Commercial Cooking Equipment."

3) Hoods, grease removal devices, fans, ducts, and other appurtenances shall be cleaned at frequent intervals to prevent surfaces from becoming heavily contaminated with grease or other residues. (See Appendix A.)

## 2.6.2.1.

4) Flammable cleaning materials or solvents shall not be used for the cleaning of exhaust systems.

5) Instructions for manually operated fire extinguishing installations shall be posted conspicuously in the kitchen as part of the fire safety plan.

6) Commercial cooking equipment which is certified shall be installed and maintained in conformance with its certification.

7) Uncertified commercial cooking equipment shall be installed and maintained in a manner acceptable to the *authority having jurisdiction* so as not to create a fire hazard.

## 2.6.2. Incinerators

### 2.6.2.1. Indoor Incinerators

1) Except as provided in Article 1.1.2.3., the installation and alteration of indoor incinerators shall conform to the Alberta Building Code.

### 2.6.2.2. Outdoor Incinerators

1) The design, construction, installation, alteration and maintenance of outdoor incinerators shall conform to NFPA 82, "Incinerators, Waste and Linen Handling Systems and Equipment" except that the *flue* venting an incinerator shall not serve as the chute conveying waste material to the incinerator.

### 2.6.2.3. Spark Arresters

1) Spark arresters installed in conformance with Articles 2.6.2.1. and 2.6.2.2. shall be inspected and cleaned at intervals not greater than 12 months or more frequently where accumulations of debris will adversely affect operations.

2) Burnt-out spark arresters shall be repaired or replaced.

## 2.6.3. Electrical Equipment Vaults

### 2.6.3.1. Use

1) Electrical equipment vaults shall not be used for storage purposes.

### 2.6.3.2. Security

1) Electrical equipment vaults shall be kept locked so that unauthorized persons will not have access to them.

# Section 2.7. Safety to Life

## 2.7.1. Means of Egress

### 2.7.1.1. Means of Egress

1) Except as provided in Article 1.1.2.3., means of *egress* shall be provided in *buildings* in conformance with the Alberta Building Code.

### 2.7.1.2. Open Floor Areas

1) Aisles in conformance with Sentences (2) to (4) shall be provided in every *floor area* that

- is not subdivided into rooms or *suites* served by corridors giving *access to exits*, and
- is required by the Alberta Building Code to have more than one egress doorway.

2) Every required egress doorway shall be served by an aisle that

- has a clear width not less than 1 100 mm,
- has access to at least one additional egress doorway, and
- at every point on the aisle, provides a choice of 2 opposite directions by which to reach an egress doorway.

3) A subsidiary aisle with only a single direction of travel to an aisle described in Sentence (2) is permitted provided it has a clear width not less than 920 mm and a length not greater than

- 7.5 m in *business and personal services, mercantile and high hazard industrial occupancies*,
- 10 m in *medium hazard industrial occupancies*, or
- 15 m in *low hazard industrial occupancies*.

4) Every individual work area in *business and personal services occupancies* shall be located adjacent to an aisle or subsidiary aisle.

### 2.7.1.3. Occupant Load

1) The maximum permissible *occupant load* for any room shall be calculated on the basis of the lesser of

- the number of occupants determined in accordance with Table 3.1.16.1. of the Alberta Building Code,
- the *occupant load* for which *means of egress* are provided, or
- the *occupant load* as calculated and posted in accordance with the Alberta Building Code.

(See Appendix A.)

2) The number of occupants permitted to enter a room shall not exceed the posted maximum

*occupant load* calculated in conformance with Sentence (1).

**3)** The *owner* shall ensure that a plan showing the floor layout and designed use of the rooms specified in Sentence (1) is made available when requested by the *authority having jurisdiction*.

#### 2.7.1.4. Signs

**1)** In *assembly occupancies* with *occupant loads* exceeding 60 persons, the *occupant load* shall be posted in conspicuous locations near the principal entrances to the room or *floor area*.

**2)** Signs required by the Alberta Building Code to indicate the *occupant load* for a *floor area* shall be posted in conspicuous locations near the principal entrances to the *floor area*. (See Appendix A.)

**3)** Signs required in Sentences (1) and (2) shall be acceptable to the *authority having jurisdiction*.

#### 2.7.1.5. Nonfixed Seating

**1)** When nonfixed seats are provided in *assembly occupancies*,

- a) except as provided in Sentence (3), the seats shall be arranged in rows having an unobstructed passage of not less than 400 mm between rows 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 behind in the unoccupied position,
- b) except as provided in Sentence (2), aisles shall be located so that there are not more than 7 seats, or 12 seats without backs, between every seat and the nearest aisle,
- c) every aisle terminates in a cross aisle, foyer or *exit* and the width of such cross aisle, foyer or *exit* is at least the required width of the widest aisle that it serves, plus 50 per cent of the total required width of the remaining aisles that it serves,
- d) except as provided in Sentence (2), the clear width of an aisle in millimetres shall be not less than the greater of 1 100 mm or the product of the number of seats served by that aisle and 6.1,
- e) the width of an aisle is permitted to be reduced to not less than 750 mm when serving 60 seats or fewer,
- f) dead-end aisles shall not be longer than 6 m,
- g) except as provided in Sentence (3), when the *occupant load* exceeds 200 persons,
  - i) the seats in a row shall be fastened together in units of no fewer than 8 seats, or

- ii) where there are 7 seats or fewer in a row, all the seats in the row shall be fastened together, and
- h) the distance to an *exit* door by means of any aisle is not more than
  - i) 30 m in the case of an *assembly occupancy* that is not *sprinklered*, or
  - ii) 45 m in the case of an *assembly occupancy* that is *sprinklered*.

**2)** When nonfixed seats are provided in outdoor places of public assembly,

- a) aisles shall be located so that there are not more than 15 seats between every seat and the nearest aisle, and
- b) the clear width of an aisle in millimetres shall be not less than the greater of 1 200 or the product of the number of seats served by that aisle and 1.8.

**3)** When nonfixed seats are provided at tables arranged in rows, the spacing between the nearest edges of tables in 2 successive rows shall be not less than

- a) 1 400 mm where seating is arranged on both sides of tables (back to back), or
- b) 1 000 mm where seating is on one side only.

**4)** Where seating is provided by means of nonfixed tables and chairs, the arrangement of the tables and chairs shall conform to NFPA 101®, "Life Safety Code®."

#### 2.7.1.6. Maintenance

**1)** *Means of egress* shall be maintained in good repair and free of obstructions.

#### 2.7.1.7. Exterior Passageways and Exit Stairs

**1)** Exterior passageways and exterior *exit* stairs serving occupied *buildings* shall be maintained free of snow and ice accumulations.

**2)** Where equipment is provided to melt snow or ice on exterior passageways and exterior *exit* stairs serving an occupied *building*, such equipment shall be maintained in working order or alternative measures shall be taken to comply with Sentence (1).

**3)** A stairway *exit* door from a floor level in a *building* that is more than 3 *storeys* in *building* height shall bear a number that indicates the floor on which the door is located and shall be

- a) located on the stairwell side of the door,
- b) centrally located 1.7 m above the bottom of the door,
- c) at least 100 mm high with a 20 mm stroke, and
- d) contrasting in colour so as to be clearly visible.

## 2.7.2.1.

4) Where an *exit* door is located so that there is a possibility of obstruction by vehicles or other objects, the door shall be identified with a sign as described in Sentence (5).

- 5) Signs required by Sentence (4) shall
- read "Fire Exit. No parking within 3 m,"
  - have red lettering on a contrasting background, and
  - have letters 100 mm high with a 15 mm stroke.

**Note:** NFPA 101® and Life Safety Code® are registered trade marks of the National Fire Protection Association, Inc., Quincy, MA 02269

## 2.7.2. Doors and Means of Egress

### 2.7.2.1. Exit Doors

- 1) Except as provided in Sentences (2), (3) and (4), all doors forming part of a *means of egress* shall be tested at intervals not greater than one month to ensure that they are operable.
- 2) The safety features of revolving doors shall be tested at intervals not greater than 12 months.
- 3) Sliding doors that are required to swing on their vertical axes in the direction of egress when pressure is applied shall be tested at intervals not greater than 12 months.
- 4) When doors are equipped with electromagnetic locks, these locks shall be tested at intervals not greater than 12 months.

### 2.7.2.2. Door Release Hardware

- 1) Except as provided in Article 1.1.2.3., door release hardware shall be installed on doors in conformance with the Alberta Building Code.
- 2) Door release hardware, latches and locks shall be maintained in good working condition at all times.
- 3) An *exit* door shall not be bolted, barred or locked other than with a device that complies with Sentence (1).

### 2.7.2.3. Records

- 1) Records of tests required in Sentences 2.7.2.1.(2), (3) and (4) shall be retained in conformance with Article 1.1.1.2.

## 2.7.3. Exit Lighting, Exit Signs and Emergency Lighting

### 2.7.3.1. Installation and Maintenance

- 1) Except as provided in Article 1.1.2.3., *exit* lighting, *exit* signs and emergency lighting shall be provided in *buildings* in conformance with the Alberta Building Code. (See Appendix A.)

2) *Exit* lighting and *exit* signs shall be illuminated during times the *building* is occupied.

3) Emergency lighting shall be maintained in operating condition, in conformance with Section 6.7.

## Section 2.8. Emergency Planning

### 2.8.1. General

#### 2.8.1.1. Application

- 1) Fire emergency procedures conforming to this Section shall be provided for
- every *building* containing an *assembly* or a *care or detention occupancy*,
  - every *building* required by the Alberta Building Code to have a fire alarm system,
  - demolition and construction sites regulated under Section 2.14. of this Code,
  - storage areas required to have a fire safety plan in conformance with Articles 3.2.2.6., 3.3.2.9. and 3.3.6.7.,
  - areas where *flammable liquids* or *combustible liquids* are stored or handled, in conformance with Article 4.1.5.6., and
  - areas where hazardous processes or operations occur, in conformance with Article 5.1.5.1.

#### 2.8.1.2. Training of Supervisory Staff

- 1) *Supervisory staff* shall be trained in the fire emergency procedures described in the fire safety plan before they are given any responsibility for fire safety. (See Appendix A.)

#### 2.8.1.3. Keys and Special Devices

- 1) Any keys or special devices needed to operate the fire alarm system or provide access to any fire protection systems or equipment shall be readily available to on-duty *supervisory staff* or located in fire department key boxes conforming to Article 2.5.1.3.

### 2.8.2. Fire Safety Plan

#### 2.8.2.1. Measures in a Fire Safety Plan

- 1) In *buildings* or areas described in Article 2.8.1.1., a fire safety plan conforming to this Section shall be prepared in cooperation with the fire department and other applicable regulatory authorities and shall include
- the emergency procedures to be used in case of fire, including

- i) sounding the fire alarm (see Appendix A),
- ii) notifying the fire department,
- iii) instructing occupants on procedures to be followed when the fire alarm sounds,
- iv) evacuating occupants, including special provisions for persons requiring assistance (see Appendix A),
- v) confining, controlling and extinguishing the fire,
- b) the appointment and organization of designated *supervisory staff* to carry out fire safety duties,
- c) the training of *supervisory staff* and other occupants in their responsibilities for fire safety,
- d) documents, including diagrams, showing the type, location and operation of the *building* fire emergency systems,
- e) the holding of fire drills,
- f) the control of fire hazards in the *building*, and
- g) the inspection and maintenance of *building* facilities provided for the safety of occupants.

(See Appendix A.)

**2)** The fire safety plan shall be reviewed at intervals not greater than 12 months to ensure that it takes account of changes in the use and other characteristics of the *building*.

### 2.8.2.2. Care or Detention Occupancies

**1)** A sufficient number of *supervisory staff* shall be on duty in *care or detention occupancies* to perform the tasks outlined in the fire safety plan described in Clause 2.8.2.1.(1)(a).

### 2.8.2.3. Assembly Occupancies

**1)** In Group A, Division 1 *assembly occupancies* containing more than 60 occupants, there shall be at least one *supervisory staff* member on duty in the *building* to perform the tasks outlined in the fire safety plan in Clause 2.8.2.1.(1)(a) whenever the *building* is open to the public.

### 2.8.2.4. High Buildings

- 1)** In *buildings* within the scope of Subsection 3.2.6. of the Alberta Building Code, the fire safety plan shall, in addition to the requirements of Sentence 2.8.2.1.(1), include
- a) the training of *supervisory staff* in the use of the voice communication system,
  - b) the procedures for the use of elevators,
  - c) the action to be taken by *supervisory staff* in initiating any smoke control or other fire emergency systems installed in a

*building* in the event of fire until the fire department arrives,

- d) instructions to the *supervisory staff* and fire department for the operation of the systems referred to in Clause (c), and
- e) the procedures established to facilitate fire department access to the *building* and fire location within the *building*.

**2)** Fire fighting procedures shall be prepared by the fire department in cooperation with the person in charge of the *building* for all *buildings* within the scope of Subsection 3.2.6. of the Alberta Building Code.

### 2.8.2.5. Retention of Fire Safety Plans

**1)** The fire safety plan shall be kept in the *building* for reference by the fire department, *supervisory staff* and other personnel.

**2)** The fire safety plan for a *building* within the scope of Subsection 3.2.6. of the Alberta Building Code shall be kept at the central alarm and control facility.

**3)** The fire safety plan and record referred to in Sentence (2) shall include instructions to the *supervisory staff* and fire department for the operation of the systems.

**4)** The fire safety plan shall be reviewed annually and when renovations or construction takes place that affect the plan.

### 2.8.2.6. Distribution

**1)** A copy of the fire emergency procedures and other duties for *supervisory staff*, as laid down in the fire safety plan, shall be given to all *supervisory staff*.

### 2.8.2.7. Posting of Fire Emergency Procedures

**1)** At least one copy of the fire emergency procedures shall be prominently posted on each *floor area* in a location acceptable to the *authority having jurisdiction*. (See Appendix A.)

**2)** In every hotel and motel bedroom, the fire safety rules for occupants shall be posted showing the locations of *exits* and the paths of travel to *exits*.

**3)** Where a fire alarm system has been installed with no provisions to transmit a signal to the fire department, a sign shall be posted at each manually actuated signalling box requesting that the fire department be notified, and including the telephone number of that department.

### 2.8.2.8. Shutdown of Fire Alarm Systems

**1)** When a fire alarm and detection system, or part thereof, is shut off for repairs, or is

### 2.8.3.1.

inoperative for more than 2 hours for any reason, the *owner* shall notify the *authority having jurisdiction*, and when directed, provide acceptable surveillance within the *building* continually until the fire alarm and detection system is restored to operating condition.

2) Procedures acceptable to the *authority having jurisdiction* shall be developed to notify occupants if a fire or other emergency occurs when the fire alarm and detection system is inoperative. (See Appendix A.)

### 2.8.3. Fire Drills

#### 2.8.3.1. Fire Drill Procedures

1) The procedure for conducting fire drills shall be determined by the person in charge of the *building*, taking into consideration

- a) the *building occupancy* and its fire hazards,
- b) the safety features provided in the *building*,
- c) the desirable degree of participation of occupants other than *supervisory staff*,
- d) the number and degree of experience of participating *supervisory staff*,
- e) the features of fire emergency systems installed in *buildings* within the scope of Subsection 3.2.6. of the Alberta Building Code, and
- f) the requirements of the fire department.

(See Appendix A.)

#### 2.8.3.2. Fire Drill Frequency

1) Fire drills as described in Sentence 2.8.3.1.(1) shall be held at intervals not greater than 12 months for the *supervisory staff*, except that

- a) in day-care centres and in Group B *major occupancies*, such drills shall be held at intervals not greater than one month,
- b) in schools attended by children, total evacuation fire drills shall be held at least 3 times in each of the fall and spring school terms, and
- c) in *buildings* within the scope of Subsection 3.2.6. of the Alberta Building Code, such drills shall be held at least every 6 months.

2) The person in charge of a *building* shall maintain and make available to the fire department a written record of all fire drills held under this Section, showing

- a) the date of the drill,
- b) the evacuation time, and
- c) comments and recommendations.

3) The record required by Sentence (2) shall be retained by the *owner* in accordance with Article 1.1.1.2.

## Section 2.9. Tents and Air-Supported Structures

### 2.9.1. General

#### 2.9.1.1. Tents and Air-Supported Structures

1) Tents and *air-supported structures* shall be in conformance with the Alberta Building Code.

### 2.9.2. Materials

#### 2.9.2.1. Flame Retardant Treatments

1) Flame retardant treatments shall be renewed as often as required to ensure that the material will pass the match flame test in NFPA 701, "Fire Tests for Flame-Resistant Textiles and Films." (See A-2.3.2.2.(1) in Appendix A.)

### 2.9.3. Fire Hazards and Control

#### 2.9.3.1. Electrical Systems

1) The electrical system and equipment in a tent or *air-supported structure*, including breakers, fuses and switches, shall be maintained and operated in accordance with the electrical regulations made pursuant to the Safety Codes Act.

2) Portable electrical systems shall be inspected for fire hazards and defects shall be corrected before the tent or *air-supported structure* is occupied by the public.

3) The electrical system and equipment in a tent or *air-supported structure*, including electrical fuses and switches, shall be inaccessible to the public.

4) Cables on the ground in areas used by the public in a tent or *air-supported structure* shall be placed in trenches or protected by covers to prevent damage from traffic.

#### 2.9.3.2. Combustible Materials

1) Hay, straw, shavings or similar combustible materials other than necessary for the daily feeding and care of animals shall not be permitted within a tent or *air-supported structure* used for an *assembly occupancy*, except that sawdust and shavings are permitted to be used if kept damp.

#### 2.9.3.3. Smoking and Open Flame Devices

1) Unless acceptable to the *authority having jurisdiction*, smoking and open flame devices shall not be permitted in a tent or *air-supported structure* while it is occupied by the public.

**2.9.3.4. Fire Watch**

1) A person shall be employed to watch for fires in tents and *air-supported structures* occupied by the public where the facilities are designed to accommodate more than 1 000 persons.

- 2) A person employed to watch for fires as described in Sentence (1) shall
- a) be familiar with all fire safety features, including the fire safety plan as provided in conformance with Section 2.8. and the condition of *exits*, and
  - b) patrol the area to ensure that the *means of egress* are kept clear and that requirements of the *authority having jurisdiction* are enforced.

**2.9.3.5. Fire Alarm System**

1) Where tents and *air-supported structures* are designed to accommodate more than 1 000 persons, a fire alarm and emergency communication system shall be provided. (See Appendix A.)

**2.9.3.6. Blower Engines**

1) Internal combustion engines used to power supplementary blowers required by the Alberta Building Code shall be operated and maintained in conformance with Section 6.7.

## Section 2.10. Day-Care Centres

**2.10.1. Construction****2.10.1.1. Construction**

1) Except as provided in Article 1.1.2.3., day-care centres shall be constructed in conformance with the Alberta Building Code.

**2.10.2. Supervision of Children****2.10.2.1. Supervision of Children**

1) The operators of day-care centres shall provide a staffing ratio for the supervision of children as required by the Social Care Facilities Licensing Act and its Regulations.

2) Where handicapped children are being cared for in a centre, sufficient staff shall be present to escort the children to safety during the period they are in the centre.

**2.10.3. Combustible Materials****2.10.3.1. Combustible Materials Attached to Walls**

1) Combustible materials such as artwork and teaching aids shall conform to Sentence 2.3.1.3.(3).

**2.10.3.2. Waste Receptacles**

1) Waste receptacles shall be made of noncombustible materials.

**2.10.3.3. Flammable and Combustible Liquids**

1) *Flammable liquids* and *combustible liquids* shall be stored in conformance with Part 4 and in areas inaccessible to children.

**2.10.4. Fire Safety Measures****2.10.4.1. Fire Prevention Inspections**

1) Staff members of day-care centres in which more than 10 children are cared for shall conduct fire prevention inspections in conformance with the fire safety plan at intervals not greater than one month.

**2.10.4.2. Portable Extinguishers**

1) Portable extinguishers shall be provided in conformance with Part 6 in all day-care centres.

## Section 2.11. Boarding and Lodging Houses

**2.11.1. General****2.11.1.1. Construction**

1) Except as provided in Article 1.1.2.3., buildings altered or occupied for purposes of providing accommodation for boarders, lodgers or roomers shall conform to the Alberta Building Code.

**2.11.2. Fire Safety Measures****2.11.2.1. Portable Extinguishers**

1) At least one portable extinguisher having a 2-A rating shall be installed in conformance with Part 6 on each *storey* of a *building* described in Article 2.11.1.1.

## 2.12.1.1.

## Section 2.12. Covered Malls

### 2.12.1. General

#### 2.12.1.1. Use

1) Except as permitted in Sentence (2), covered malls designed for ornamental and pedestrian oriented uses only shall not be used for merchandising or public activities.

2) A covered mall referred to in Sentence (1) is permitted to be used for merchandising or public activities on a temporary basis provided

- a) it conforms to Articles 2.12.1.2. to 2.12.1.9., and
- b) the fire safety plan required in Section 2.8. includes additional provisions to offset any hazard that may be created by such activity.

#### 2.12.1.2. Adequacy of Sprinkler System

1) Merchandising or public activities in a *sprinklered* covered mall described in Article 2.12.1.1. shall not be permitted where such activity will create a hazard exceeding the design criteria for which the sprinkler system was designed.

#### 2.12.1.3. Alternatives to Spatial Separation

1) When a covered mall having a width of not less than 9 m has been provided for the purpose of considering each portion of the *building* separated by the mall as a separate *building*, merchandising or public activities are permitted within the required 9 m width provided alternative protection is installed in conformance with Article 1.1.2.3.

#### 2.12.1.4. Access to Exits

1) *Access to exits* within a covered mall shall be provided and maintained in conformance with Subsection 2.7.1.

2) If a public corridor conforming to Clause 3.4.2.5.(1)(d) of the Alberta Building Code contains an *occupancy*, the *occupancy* shall be located so that there is an unobstructed width for pedestrian travel of not less than 3 m at all times adjacent and parallel to all *occupancies*, rooms and *suites* that front onto the public corridor and the combined area of all *occupancies* shall be not more than 15 per cent of the area of the public corridor.

3) Where the *occupancy* referred to in Sentence (2) is immediately adjacent to a room or *suite* fronting the public corridor, it shall be separated from such room or *suite* in accordance with Article 3.3.1.1. of the Alberta Building Code.

#### 2.12.1.5. Access to Fire Protection Equipment

1) Where a covered mall is used for merchandising or public activities, the activity shall be arranged so that access to fire protection equipment, including sprinkler control valves, fire hose stations, portable extinguishers and fire alarm stations, is not restricted.

#### 2.12.1.6. Decorative Materials

1) Decorative materials used for merchandising or public activities in a covered mall shall conform to Subsection 2.3.2.

#### 2.12.1.7. Flammable and Combustible Liquids and Flammable Gases

1) *Flammable liquids*, *combustible liquids* and Class 2.1 flammable gases shall not be used or displayed in a covered mall.

#### 2.12.1.8. Fuelled Equipment

1) Where a covered mall is used for the display of fuelled equipment, caps for fuel tanks shall be locked or secured against tampering.

#### 2.12.1.9. Propane Fuelled Automotive Vehicles

1) A propane fuelled automotive vehicle shall not be displayed in a covered mall.

## Section 2.13. Helicopter Landing Areas on Roofs

### 2.13.1. Construction

#### 2.13.1.1. Construction

1) Helicopter landing areas on roofs shall be constructed in conformance with the requirements for heliports contained in the "Airport Regulations of the Aeronautics Act" of Transport Canada.

### 2.13.2. Fire Safety Measures

#### 2.13.2.1. Fire Separations

1) Areas or rooms communicating with the landing area shall be separated therefrom by a *fire separation* conforming to the Alberta Building Code.

#### 2.13.2.2. Fire Alarm

1) 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.

2) Helicopter landing areas on roofs shall be provided with telephone extensions or means to notify the fire department in conformance with the Alberta Building Code.

#### 2.13.2.3. Smoking

1) Smoking shall not be permitted on helicopter landing areas on roofs, and signs conforming to Article 2.4.2.2. shall be placed at the *exits* from the rooftop and in the vicinity of the landing area.

#### 2.13.2.4. Fire Watch

1) Two persons knowledgeable in the use of fire fighting equipment shall be in attendance on the roof deck at each landing area when it is in use.

#### 2.13.2.5. Refuelling, Repair and Maintenance Operations

1) Helicopter refuelling, repair and maintenance operations shall not be carried out on helicopter landing areas on roofs except in an emergency and when appropriate acceptable safety procedures have been prepared in cooperation with the fire department.

#### 2.13.2.6. Inspection of Separators

1) Aviation fuel and oil separators provided in the drainage system shall be inspected at intervals not greater than 7 days to ensure safe operation and shall be serviced when necessary.

## Section 2.14. Construction and Demolition Sites

### 2.14.1. General

#### 2.14.1.1. Application

1) This Section applies to *buildings* or parts of *buildings* undergoing construction or demolition operations and includes renovations.

2) The degree of application of this Section to each construction project and each demolition project shall be determined as part of the fire safety plan prior to the commencement of operations. (See Appendix A.)

#### 2.14.1.2. Fire Safety Plan

1) Prior to the commencement of construction or demolition operations, a fire safety

plan conforming to Section 2.8. shall be prepared for the site.

- 2) The fire safety plan shall include
- a) the designation and organization of site personnel to carry out fire safety duties, including fire watch service if applicable,
  - b) the emergency procedures to be used in the case of fire, including
    - i) sounding the fire alarm,
    - ii) notifying the fire department,
    - iii) instructing site personnel on procedures to be followed when the alarm sounds, and
    - iv) fire fighting procedures,
  - c) the control of fire hazards in and around the *building* (see Appendix A), and
  - d) maintenance of fire fighting facilities (see Appendix A).

### 2.14.1.3. Fire Safety

1) Fire safety at construction sites and demolition sites shall conform to Part 8 of the Alberta Building Code.

## Section 2.15. Industrial Relocatable Accommodation

### 2.15.1. General

#### 2.15.1.1. General

1) In this Section, industrial relocatable accommodation means a *building* that is used to provide accommodation for an industrial work force that lives and works at a temporary location.

2) Except as provided in Article 1.1.2.3., industrial relocatable accommodation shall conform with the requirements of the Alberta Building Code.

3) The *owner* of industrial relocatable accommodation shall, at each camp location he owns

- a) appoint a fire crew and ensure that it is trained for fire fighting duties at the camp,
- b) ensure that the work force is familiar with the fire hazards that exist in and around the camp, and
- c) appoint one person to be responsible for fire prevention and inspection duties in the camp.

4) The person appointed under Clause (3)(c) shall inspect the camp complex, including all industrial relocatable accommodation, for fire hazards on a monthly basis.

## 2.16.1.1.

- | **5)** The person making the inspection required by Sentence (4) shall provide the *owner* with a written report of his findings.
- | **6)** The inspections required by Sentence (4) may be suspended if
  - a) the camp is vacated for a period of 2 months or more,
  - b) the final inspection report is considered during the closing down process, and
  - c) the final inspection report is incorporated as an integral part of the re-inspection plans prior to the camp being re-occupied.

## Section 2.16. Homes and Hospitals

### 2.16.1. General

#### 2.16.1.1. Inspection

- | **1)** The person in charge of a *building* classified as a Group B, Division 2 *occupancy* shall appoint a fire marshal.
- | **2)** A fire marshal appointed under Sentence (1) shall, at least every 6 months, inspect the *building* and all related *buildings* for fire hazards and provide a written report to the person in charge indicating
  - a) the condition of the exits, fire extinguishers and fire alarm equipment, and
  - b) any other conditions relative to fire safety in the *building* or related *buildings*.
- | **3)** The person in charge shall forward a copy of the report referred to in Sentence (2) to the *authority having jurisdiction*.

# Part 3

## Indoor and Outdoor Storage

### Section 3.1. General

#### 3.1.1. Scope

##### 3.1.1.1. Application

1) This Part applies to the storage of combustible products and *dangerous goods*, both inside and outside of *buildings*.

##### 3.1.1.2. Radioactive Materials

1) Class 7 radioactive materials shall be stored in conformance with the "Atomic Energy Control Act" and its Regulations.

##### 3.1.1.3. Explosives

1) The storage of explosives, blasting agents, detonators, propellant explosives, pyrotechnics, and ammunition shall be in conformance with the "Explosives Act" (Canada) and its Regulations.

##### 3.1.1.4. Compressed Gases

- 1) This Part shall not apply to
  - a) facilities operated by manufacturers or distributors at which Class 2 gases are manufactured, or containers are filled or distributed, provided that storage and handling is in conformance with good engineering practice (see Appendix A), and
  - b) the storage and dispensing of Class 2.1 flammable gases at *fuel dispensing stations* covered in Section 4.5. of this Code.

2) Except as provided in this Part, the storage and handling of liquefied petroleum gases shall conform to gas regulations made pursuant to the Safety Codes Act.

3) Except as provided in this Part, the storage and handling of natural gas shall conform to gas protection regulations made pursuant to the Safety Codes Act.

#### 3.1.2. Dangerous Goods

##### 3.1.2.1. Classification

1) Classes and divisions of *dangerous goods* referred to in this Code shall mean their primary

and first subsidiary classification, as defined in Part III of the "Transportation of Dangerous Goods Regulations."

2) Class 9 *dangerous goods* shall be stored according to the hazard they present based on their properties as *dangerous goods*.

##### 3.1.2.2. Ambient Temperature

1) Class 5.1 ammonium nitrate and Class 2 gases shall not be stored in an area where the ambient air temperature is higher than 52°C.

2) *Dangerous goods* shall be stored in refrigerated areas where such refrigeration is necessary to stabilize the substances.

##### 3.1.2.3. Packages and Containers

- 1) *Dangerous goods* shall be stored in packages or containers
  - a) made of materials that are compatible with the product they contain, and
  - b) of durable construction and designed to resist damage from normal material handling activities.
- 2) Where the package or container for a specific type of *dangerous goods* is subject to a standard established by a transportation regulatory authority, such package or container shall conform with the applicable standard. (See Appendix A.)

##### 3.1.2.4. Compressed Gases

1) Cylinders and tanks of Class 2 gases shall be protected against mechanical damage.

2) Cylinders of Class 2 gases which are in storage shall be

- a) protected against valve damage (see Appendix A), and
- b) firmly secured in a position that will not interfere with the operation of the cylinder valve assembly.

3) Cylinders of Class 2 gases shall be transported in devices designed to provide restraint against movement in any direction.

4) Except for portable fire extinguishers, cylinders of Class 2 gases shall not be stored

### 3.1.2.5.

- a) in any *exit* or corridor providing *access to exits*,
- b) under any fire escape, outside *exit* stair, passage or ramp, or
- c) within 1 m of any *exit* in *buildings* other than *industrial occupancies*.

#### 3.1.2.5. Reactive Substances

1) Reactive substances shall be stored according to their properties as *dangerous goods* in conformance with Part III of the "Transportation of Dangerous Goods Regulations." (See Appendix A.)

2) Reactive substances that are unstable and susceptible to reactions, such as polymerization, or self-accelerating decomposition initiated by heat, shock, vibration, light or sound waves, shall be stored in a location and manner that will prevent the undesired reaction.

3) Reactive substances that may react with water shall be stored in sealed containers in a dry location.

4) Reactive substances that ignite spontaneously in air shall be stored in a liquid that is inert to the material, in an inert atmosphere or in sealed containers.

5) Every *building* or part of a *building* that is used for the storage or use of any substance that reacts violently with water shall be plainly and conspicuously marked on the outside with signage visible from 6 m using the words, "REACTIVE SUBSTANCE, USE NO WATER."

#### 3.1.2.6. Fire Safety Plan

1) In addition to the information required in Section 2.8., where *dangerous goods* are stored or handled, the fire safety plan shall include the names, addresses and telephone numbers of persons to be contacted in case of fire during non-operating hours.

2) When the *dangerous goods* referred to in Sentence (1) consist of Class 7 radioactive materials, the fire safety plan shall also include

- a) methods to control a fire emergency and to recover radioactive materials and equipment containing radioactive materials safely and efficiently,
- b) the names, addresses and telephone numbers of primary and alternative sources of expert radiation safety advice and assistance, and
- c) the location of primary and alternative sources of radiation survey instruments.

#### 3.1.3. Industrial Trucks

##### 3.1.3.1. Industrial Trucks

1) Except as provided in Sentences (2) and (3), the designation, use, maintenance and operation

of industrial trucks shall conform to NFPA 505, "Powered Industrial Trucks."

2) Fuel-fired industrial trucks shall conform to ULC-C558, "Internal Combustion Engine-Powered Industrial Trucks."

3) Battery-powered industrial trucks shall conform to ULC-C583, "Electric Battery Powered Industrial Trucks."

4) Propane cylinders shall be stored in conformance with gas regulations made pursuant to the Safety Codes Act.

#### 3.1.4. Electrical Installations

##### 3.1.4.1. Hazardous Locations

1) Where wiring or electrical equipment is located in areas in which flammable gases or vapours, *combustible dusts* or *combustible fibres* are present in quantities sufficient to create a hazard, such wiring and electrical equipment shall conform to electrical regulations made pursuant to the Safety Codes Act for hazardous locations. (See A-5.1.2.1.(1) in Appendix A.)

#### 3.1.5. Basements

##### 3.1.5.1. Use

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.

## Section 3.2. Indoor Storage

### 3.2.1. Scope

#### 3.2.1.1. Application

1) Except as permitted in Sentence (2), this Section shall apply to *buildings* or parts of *buildings* used for the short or long term storage of the following products, whether raw or waste materials, goods in process, or finished goods:

- a) Class I, II, III and IV commodities, and Group A, B and C plastics, in conformance with NFPA 231, "General Storage" (see Appendix A),
- b) rubber tires and *combustible fibres*,
- c) Level 1, 2 and 3 aerosols, as described in Subsection 3.2.5.,
- d) *dangerous goods* as described in Subsection 3.2.7., or
- e) *closed containers* of *distilled beverage alcohols*.

(See Appendix A.)

2) High *rack* storage warehouses with storage heights greater than 13 m, where conditions exist which must be addressed by design and operational details specific to the hazard, need not conform to this Section, where alternative protection is provided in conformance with Part 1.

### 3.2.2. General

#### 3.2.2.1. Application

1) Unless otherwise specified, this Subsection shall apply to the indoor storage of any product covered in this Section.

#### 3.2.2.2. Access Aisles

(See Appendix A.)

1) Adequate access for fire fighting purposes shall be provided and maintained to all portions of the storage area.

2) Access aisles not less than 1.0 m wide shall be provided to fire department access panels and to fire protection equipment.

3) Aisles shall be maintained free of obstruction.

4) A storage room or area that is greater than 100 m<sup>2</sup> shall be provided with at least one main aisle conforming to Sentences (5) to (8).

5) Except as permitted in Sentence (6), main access aisles shall have a minimum width of

- a) 2.4 m for storage heights of not more than 6 m, and
- b) 3.6 m for storage heights of more than 6 m.

6) The width of main access aisles referred to in Sentence (5) need not exceed 2.4 m where the products are stored in *racks* and the *building* is *sprinklered*.

7) Main access aisles shall extend

- a) the length of the storage area where only one main access aisle is provided, or
- b) the length or width of the storage area where 2 or more main access aisles are provided.

8) Main access aisles shall be accessible from at least 2 fire department access points.

#### 3.2.2.3. Clearances

1) Wall clearances of not less than 600 mm shall be maintained where stored products may swell or expand with the absorption of water.

2) Except where the width of storage is not more than 1.5 m, measured out from the wall, wall clearances of not less than 400 mm shall be maintained when the quantity of *dangerous goods* stored in a *building* exceeds the quantities shown in Table 3.2.7.1.

3) In unsprinklered *buildings*, a clearance of not less than 1 m between top of storage and underside of floor or roof deck shall be maintained. (See Appendix A.)

4) If the top of storage in piles, on shelves, in bin boxes or on *racks* is above the lower chords of floor or roof structural framing members, a clear space of not less than 300 mm shall be maintained between the storage and the structural members.

5) In *sprinklered buildings*, the clearance between top of storage and ceiling sprinkler deflectors shall not be less than 450 mm.

6) Clearance between stored products and duct or blower systems shall be maintained in conformance with Section 2-6 of NFPA 91, "Exhaust Systems for Air-Conveying of Materials." (See Appendix A.)

#### 3.2.2.4. Combustible Pallets

1) Except as permitted in Sentences (2) and (3), combustible pallets shall be

- a) stored outdoors in conformance with Section 3.3., and
- b) located or protected so as to avoid creating a fire exposure hazard.

2) Indoor storage of combustible pallets is permitted in a *building* that is not *sprinklered*, provided

- a) the height of storage of combustible pallets is not more than 1.2 m,
- b) the width of an *individual storage area* is not more than 7.5 m, and
- c) the aggregate area of storage is not more than
  - i) 100 m<sup>2</sup> for wood or solid deck non-expanded polyethylene pallets, or
  - ii) 50 m<sup>2</sup> for plastic pallets not designated in Subclause (i).

3) In a *sprinklered building*, the storage of combustible pallets is permitted to exceed the values in Sentence (2) provided the sprinkler system conforms to NFPA 231, "General Storage." (See Appendix A.)

#### 3.2.2.5. Portable Extinguishers

1) Except as provided in Article 3.2.4.5., portable extinguishers shall be provided in conformance with Part 6.

## 3.2.2.6.

### 3.2.2.6. Fire Safety Plan

- 1) A fire safety plan conforming to Section 2.8. and Sentences (2) and (3) shall be prepared.
- 2) The fire safety plan shall identify
  - a) the product classifications, as described in Sentence 3.2.1.1.(1), for each part of the *building* where products of different classification are stored,
  - b) the method of storage, including aisle widths for *rack* storage,
  - c) the maximum permitted height of storage for the *building* or part of the *building*, if different,
  - d) the maximum permitted size of *individual storage areas*,
  - e) in *sprinklered buildings*, the sprinkler system design criteria, inside and outside hose allowances, and results of the benchmark sprinkler system main drain and water flow tests.
- 3) The storage method and maximum height of storage as described in Clauses (2)(b) and (c) shall be posted in the storage area.
- 4) Signs required in Sentence (3) shall have
  - a) a minimum dimension of 200 mm, and
  - b) letters not less than 25 mm high.

### 3.2.2.7. Location of Hazardous Materials

- 1) When the products stored include Group A plastics, rubber products, Level 2 or 3 aerosols, or *dangerous goods*, an up-to-date record of their

location on each *floor area* shall be kept with the fire safety plan.

## 3.2.3. General Indoor Storage

### 3.2.3.1. Application

- 1) This Subsection applies to the indoor storage of Class I to IV commodities, Group A, B or C plastics, and *closed containers* of *distilled beverage alcohol*, in solid piles, on pallets, on shelves or in bin boxes or *racks*.

- 2) When *flammable liquids* or *combustible liquids* are stored inside an area covered in this Subsection, they shall be in conformance with Subsection 4.2.8.

### 3.2.3.2. Individual Storage Areas

- 1) Except as provided in Sentence (2), the size of *individual storage areas* shall not exceed the limits shown in Table 3.2.3.2.

- 2) In a *sprinklered building*, the height of storage in *racks* is permitted to exceed the limits shown in Table 3.2.3.2. (See Appendix A.)

### 3.2.3.3. Sprinkler Systems

- 1) Where a sprinkler system is required to accommodate *individual storage areas* referred to in Article 3.2.3.2., the sprinkler system shall be designed and installed in conformance with Sentences (2) to (4).

**Table 3.2.3.2.**  
**Size Limits for Individual Storage Areas**  
Forming Part of Sentences 3.2.3.2.(1) and (2)

Product Classification	Uns sprinklered <i>Buildings</i>		<i>Sprinklered Buildings</i>	
	Area, m <sup>2</sup>	Height of Storage, m	Area, m <sup>2</sup>	Height of Storage, m
Class I commodities	500	6.5	1 500	9.0
Class II commodities	500	6.5	1 500	9.0
Class III commodities, Group C plastics	250	4.5	1 000	9.0
<i>Closed containers</i> of <i>distilled beverage alcohol</i>	250	4.5	1 000	9.0
Class IV commodities, Group B plastics	250	3.6	1 000	9.0
Group A plastics	250	1.5	500	6.1

**2)** For Class I, II, III or IV commodities, and Group B or C plastics, the sprinkler system referred to in Sentence (1) shall be designed and installed in conformance with

- a) NFPA 13, "Installation of Sprinkler Systems," where the height of storage is not greater than 3.6 m,
- b) NFPA 231, "General Storage," where the height of storage is greater than 3.6 m in piles, on pallets, on shelves, or in bin boxes, or
- c) NFPA 231C, "Rack Storage of Materials," where the height of storage is greater than 3.6 m in *racks*.

**3)** For Group A plastics, the sprinkler system referred to in Sentence (1) shall be designed and installed in conformance with

- a) NFPA 231, "General Storage," where storage is on pallets, on shelves, or in bin boxes, or
- b) NFPA 231C, "Rack Storage of Materials," where the product is stored in *racks*.

**4)** For *closed containers* of distilled beverage alcohol, the sprinkler system referred to in Sentence (1) shall be designed in conformance with good engineering practice. (See Appendix A.)

### 3.2.4. Indoor Tire Storage

#### 3.2.4.1. Application

**1)** This Subsection shall apply to *buildings* or parts of *buildings* used for the storage of rubber tires.

#### 3.2.4.2. Fire Separations

**1)** A tire storage area designed to contain more than 375 m<sup>3</sup> of rubber 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 Appendix A.)

#### 3.2.4.3. Sprinkler Protection

**1)** *Buildings* regulated by this Subsection shall be *sprinklered* in conformance with NFPA 231D, "Storage of Rubber Tires," whenever

- a) the aggregate of *individual storage areas* in the *building* exceeds 500 m<sup>2</sup>,
- b) any *individual storage area* exceeds 250 m<sup>2</sup>, or
- c) the height of storage is more than 3.6 m, and the total volume of tires in the *building* is more than 375 m<sup>3</sup>.

#### 3.2.4.4. Clearance from Sprinklers

**1)** A clearance of not less than 900 mm shall be maintained between the top of storage and sprinkler deflectors.

#### 3.2.4.5. Portable Extinguishers

**1)** In addition to the requirements of Part 6 of this Code, multipurpose dry chemical portable extinguishers rated 4-A:20-B shall be installed in conformance with NFPA 10, "Portable Fire Extinguishers" except that

- a) there shall be one such extinguisher for every 500 m<sup>2</sup> of *floor area*, and
- b) the travel distance to any extinguisher shall not exceed 25 m.

### 3.2.5. Indoor Storage of Aerosol Products

#### 3.2.5.1. Application

**1)** This Subsection shall apply to the indoor storage of packaged aerosol products as classified in Article 3.2.5.2. (See Appendix A.)

#### 3.2.5.2. Classification

**1)** For the purposes of this Subsection, aerosol products shall be classified as Level 1, 2 or 3 in conformance with NFPA 30B, "Manufacture and Storage of Aerosol Products." (See Appendix A.)

#### 3.2.5.3. Level 1 Aerosols

**1)** Packaged Level 1 aerosol products shall be protected as required for Class III commodities, in both palletized and *rack* storage, in conformance with Article 3.2.3.2.

#### 3.2.5.4. Level 2 and 3 Aerosols

**1)** The storage of packaged Level 2 and 3 aerosol products shall conform to Table 3.2.5.4. and Articles 3.2.5.5. to 3.2.5.8.

**2)** Where storage of packaged aerosol products is mixed, protection shall be provided for the most hazardous classification present.

### 3.2.5.5.

**Table 3.2.5.4.**  
**Maximum Amount of Packaged Level 2 and 3 Aerosol Products, kg<sup>(1)</sup>**  
Forming Part of Sentences 3.2.5.4.(1) and 3.2.5.5.(2)

Product Classification	Type of Dedicated Area Required					
	Unsprinklered <i>Building</i>			Sprinklered <i>Building</i>		
	None	A <sup>(2)</sup>	B <sup>(3)</sup>	None	A <sup>(2)</sup>	B <sup>(3)</sup>
Level 2 and 3	1 000	5 000	10 000	10 000	50 000	No Limit

#### Notes to Table 3.2.5.4.:

(1) One pallet load of packaged aerosols is approximately 1 000 kg.

(2) See Article 3.2.5.6.

(3) See Article 3.2.5.7.

### 3.2.5.5. Sprinkler Systems

**1)** Where a sprinkler system is required to accommodate the storage limits in Sentence 3.2.5.4.(1), the sprinkler system shall be designed and installed in conformance with Sentence 3.2.3.3.(2), with additional sprinkler protection provided in conformance with NFPA 30B, "Manufacture and Storage of Aerosol Products" for areas in which packaged aerosol products are stored.

**2)** Where the sprinkler system required to accommodate the storage limits in Sentence 3.2.5.4.(1) does not conform to Sentence (1), the storage of packaged Level 2 or 3 aerosol products shall conform to Table 3.2.5.4. for unsprinklered *buildings*.

### 3.2.5.6. Type A Dedicated Areas

**1)** Where a Type A dedicated storage area is required to accommodate the storage limits in Sentence 3.2.5.4.(1), it shall be separated from the remainder of the *building* by

- a chain link fence conforming to Sentence (2), or
- sheet metal or other noncombustible *partitions* capable of withstanding the impact of rocketing cans, and extending to the underside of the roof deck or to a ceiling capable of withstanding the impact of rocketing cans.

**2)** Chain link fencing referred to in Sentence (1) shall be not lighter than 3.8 mm steel wire woven into a 50 mm diamond mesh.

### 3.2.5.7. Type B Dedicated Areas

**1)** Where a Type B dedicated storage area is required to accommodate the storage limits in Sentence 3.2.5.4.(1), it shall be separated from the remainder of the *building* by *partitions*

- having not less than a 1 h *fire-resistance rating*,

- capable of withstanding the impact of rocketing cans, and
- extending to the underside of the roof or to a ceiling of construction equivalent to the *partitions*.

### 3.2.5.8. Storage Height

**1)** Except as provided in Sentence (2), the height of storage of packaged Level 2 or 3 aerosols shall be not greater than

- 1.75 m where products are in solid piles or on pallets, or
- 6.1 m where products are on *racks*.

**2)** Where the *building* is *sprinklered* in conformance with Article 3.2.5.5., and an enclosure conforming to Article 3.2.5.6. or 3.2.5.7. is provided, the height of storage of packaged Level 2 or 3 aerosols shall be not greater than

- 6.1 m where products are in solid piles or on pallets, or
- the height limit determined by the design capacity of the sprinkler system where products are on *racks*.

### 3.2.5.9. Aisles

**1)** Aisles separating *racks*, shelves, or piles of packaged Level 2 or 3 aerosol products shall be not less than 2.4 m wide.

## 3.2.6. Indoor Storage of Combustible Fibres

### 3.2.6.1. Application

**1)** This Subsection shall apply to the storage of *combustible fibres* inside *buildings*.

### 3.2.6.2. Building Construction

**1)** Except as provided in Article 1.1.2.3., *buildings* used for the storage of baled *combustible fibres* shall comply with the height and area

limitations of the Alberta Building Code for *buildings* classified as Group F, Division 2.

**2)** *Combustible fibres* shall be stored only in warehouses which are protected by standpipe and hose systems installed in conformance with the Alberta Building Code.

### 3.2.6.3. Loose Combustible Fibres

**1)** Up to 3 m<sup>3</sup> of loose *combustible fibres* are permitted to be kept in any *building* provided storage is in a metal-lined bin equipped with a self-closing metal-lined cover.

**2)** Quantities of loose *combustible fibres* exceeding 3 m<sup>3</sup> but not exceeding 15 m<sup>3</sup> shall be stored in rooms separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* of not less than 1 h.

**3)** Quantities of loose *combustible fibres* exceeding 15 m<sup>3</sup> but not exceeding 30 m<sup>3</sup> shall be stored in rooms separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* of not less than 2 h.

**4)** Quantities of loose *combustible fibres* exceeding 30 m<sup>3</sup> shall not be stored in an individual room unless the room is

- a) *sprinklered* in conformance with Article 6.5.1.1., and
- b) separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* of not less than 2 h.

### 3.2.6.4. Baled Combustible Fibres

**1)** Except as permitted in Sentences (2), (3) and (4), baled *combustible fibres* shall be stored so that

- a) no *individual storage area* exceeds 250 m<sup>2</sup>,
- b) the height of storage in an *individual storage area* does not exceed 4.5 m,
- c) subsidiary aisles within *individual storage areas* are not less than 1 m wide, and
- d) the clearance between piles and *building* walls is not less than 1 m.

**2)** Except as permitted in Sentence (4), where baled *combustible fibres* are stored in *sprinklered buildings*, the maximum area of any *individual storage area* shall be 500 m<sup>2</sup>.

**3)** Where baled raw pulp is stored in an *unsprinklered building*,

- a) the maximum area of any *individual storage area* shall be 500 m<sup>2</sup>, and

- b) the maximum height of storage shall be 6 m.

**4)** Where baled raw pulp is stored in a *sprinklered building*,

- a) the maximum area of any *individual storage area* shall be 1 000 m<sup>2</sup>, and
- b) the maximum height of storage shall be 6 m.

**5)** The sides of baled storage piles shall be inclined back from the base of the pile with a slope of not less than 1 m for each 10 m of height.

### 3.2.6.5. Clearance from Sprinklers

**1)** The clearance between the top of any pile and sprinkler head deflectors shall be not less than 900 mm.

### 3.2.6.6. Heating Equipment

**1)** Storage areas for *combustible fibres* shall not contain fuel-fired *appliances* or electrical heating elements.

**2)** Shields shall be provided that will prevent stored material from coming within 300 mm of any part of a heating system.

## 3.2.7. Indoor Storage of Dangerous Goods

### 3.2.7.1. Application

**1)** Except as provided in Part 4 or otherwise specified in this Code, this Subsection shall apply to *buildings* or parts of *buildings* where *dangerous goods* in packages or containers are stored in a single *fire compartment* in quantities greater than those shown in Table 3.2.7.1.

**2)** When a product has a primary and a subsidiary classification, the quantities referred to in Sentence (1) shall be determined by

- a) using the classification having precedence as established in Schedule I of Section 3.8. of the "Transportation of Dangerous Goods Regulations," or
- b) using the lesser of the two small quantity exemptions in Table 3.2.7.1. when the precedence referred to in Clause (a) is not established.

### 3.2.7.1.

**Table 3.2.7.1.**  
**Small Quantity Exemptions for Dangerous Goods**  
 Forming Part of Sentences 3.2.2.3.(2), 3.2.7.1.(1) and (2), and 3.3.4.1.(2) and (3)

Class <sup>(1)</sup>	<i>Dangerous Goods</i>	Maximum Exempt Amount
1	Explosives	(See Subsection 3.1.1.)
2	Gases	
	Division 1 <sup>(1)</sup> Flammable	25 kg <sup>(2)</sup>
	Division 2 Non-flammable	150 kg
	Division 3 Poisonous	0
	Division 4 Corrosive	0
3	<i>Flammable Liquids and Combustible Liquids</i>	0 <sup>(3)</sup>
4	Flammable Solids	
	Division 1 Flammable solids	100 kg <sup>(4)</sup>
	Division 2 Subject to spontaneous ignition	50 kg
	Division 3 Reactive with water	50 kg
5	Oxidizing Substances	
	Division 1 Oxidizers	250 kg or 250 L
	Division 2 Organic peroxides	100 kg or 100 L
6	Poisonous and Infectious Substances	
	Division 1 Poisonous substances	
	Packing Group I <sup>(5)</sup>	0
	Packing Group II	100 kg or 100 L
	Packing Group III	1 000 kg or 1 000 L
	Division 2 Infectious substances	0
7	Radioactive Materials	(See Subsection 3.1.1.)
8	Corrosive Substances	
	Packing Group I	500 kg or 500 L
	Packing Group II	1 000 kg or 1 000 L
	Packing Group III	2 000 kg or 2 000 L
9	Miscellaneous	
	Division 1 Miscellaneous	See Article 3.1.2.1. <sup>(6)</sup>
	Division 2 Environmental hazard	See Article 3.1.2.1. <sup>(6)</sup>
	Division 3 Specific wastes	See Article 3.1.2.1. <sup>(6)</sup>

**Notes to Table 3.2.7.1.:**

- (1) The numbers refer to the class and division of *dangerous goods*, as defined in the "Transportation of Dangerous Goods Regulations."
- (2) See A-3.2.8.2.(2) in Appendix A.
- (3) See Part 4.
- (4) 50 kg for nitrocellulose based products, and 10 kg for "strike anywhere" matches.
- (5) The "Transportation of Dangerous Goods Act" defines "packing group" as "a level of hazard inherent to *dangerous goods* ." Packing Group I products are more hazardous than Packing Group III products.
- (6) Small quantity exemptions may be determined by other authorities such as the "Transportation of Dangerous Goods Act," the "Workplace Hazardous Materials Information System" (WHMIS), and environmental protection legislation.

**3.2.7.2. Ignition Sources**

**1)** Heating *appliances* shall not be permitted in a *fire compartment* used for the storage of Class 2.1, 3, 4 or 5 *dangerous goods* unless they are installed in a manner that will not create a fire or explosion hazard.

**2)** Smoking shall not be permitted within a *fire compartment* used for the storage of *dangerous goods* and signs shall be posted in conformance with Article 2.4.2.2.

**3)** Except as provided in Subsection 3.1.3. and in Section 5.2., open flames and spark-producing devices shall not be used in an area where *dangerous goods* are stored.

**3.2.7.3. Ambient Conditions**

**1)** Rooms or parts of *buildings* used for the storage of *dangerous goods*

- a) shall be dry and cool, and
- b) where the products being stored are capable of releasing flammable vapours or toxic gases under normal ambient conditions, shall be provided with a ventilation system to exhaust such vapours or gases outdoors to an area where they will not return to the *building* (see Appendix A).

**3.2.7.4. Housekeeping**

**1)** Areas where *dangerous goods* are stored shall be kept free of waste packaging materials, debris of any kind, or any spilled product.

**2)** Broken packages or containers of *dangerous goods* shall be moved to a safe location and the product repackaged and labelled as soon as possible.

**3.2.7.5. Storage Arrangements**

**1)** The method of storage of *dangerous goods* shall

- a) be determined to ensure stability of the stored products, and
- b) except as provided in Sentences (2) and (5), not exceed the maximum heights of storage shown in Table 3.2.7.5.

**2)** Storage heights for a protected storage area in Table 3.2.7.5. are permitted to be exceeded provided the *dangerous goods* are stored on *racks* or shelves.

**3)** When a storage area is required by this Article to be protected, it shall be *sprinklered* or protected with a special fire suppression system, in conformance with Part 6 and good engineering

practice with respect to specific *dangerous goods*. (See A-3.2.7.9.(1) in Appendix A.)

**4)** Except for Class 2 gases, stored *dangerous goods* shall be kept not less than 100 mm above the floor level.

**5)** *Flammable liquids* and *combustible liquids* shall be stored in conformance with Part 4.

**6)** Solid and liquid Class 5 oxidizing substances shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* of not less than 2 h.

**7)** Reactive substances 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 A-3.1.2.5.(1) in Appendix A.)

**8)** Packages or containers of Class 5.2 organic peroxides shall not be opened, or the product dispensed, in the same area where it is stored.

**Table 3.2.7.5.**  
**Storage Height Limits for Dangerous Goods, m**  
Forming Part of Sentences 3.2.7.5.(1) and (2)

Classification <sup>(1)</sup>	Unprotected Storage	Protected Storage
Packing Group I	1.8	2.4
Packing Group II	2.4	4
Packing Group III	4.5	6

**Notes to Table 3.2.7.5.:**

(1) See Table 3.2.7.1.

**3.2.7.6. Separation from Other Dangerous Goods**

**1)** Except as required in Sentences (2) and (3), *dangerous goods* shall be separated from other *dangerous goods* in conformance with Table 3.2.7.6.

**2)** In addition to the separation requirements in Sentence (1), *dangerous goods* shall be stored in conformance with the information provided in the Material Safety Data Sheet for the specific *dangerous good*. (See Appendix A.)

**3)** *Flammable liquids* or *combustible liquids* or Class 8 corrosive substances shall not be stored with Class 7 radioactive materials in quantities or in a manner that would constitute an undue risk in the event of a fire.

### 3.2.7.7.

**Table 3.2.7.6.**  
**Separation Chart for Storage of Dangerous Goods**  
Forming Part of Sentences 3.2.7.6.(1), 3.2.7.9.(2), 3.3.4.3.(2) and 4.2.2.3.(2)

Classification <sup>(1)</sup>	2.1	2.2	2.3	2.4	3	4.1	4.2	4.3	5.1	5.2	6	8
2.1	-	P	X	X	P	P	A	DS	X	X	X	X
2.2	P	-	P	P	P	P	P	P	P	P	P	P
2.3	X	P	-	A	X	A	A	DS	A	X	P	A
2.4	X	P	A	-	X	A	A	DS	A	X	DS	A
3	P	P	X	X	-	P	A	A	X	X	DS	A
4.1	P	P	A	A	P	-	A	DS	X	X	DS	A
4.2	A	P	A	A	A	A	-	DS	X	X	DS	A
4.3	DS	P	DS	DS	A	DS	DS	-	X	X	DS	X
5.1	X	P	A	A	X	X	X	X	-	P	A	X
5.2	X	P	X	X	X	X	X	X	P	-	X	X
6	X	P	P	DS	DS	DS	DS	DS	A	X	-	A
8	X	P	A	A	A	A	A	X	X	X	A	-

X Incompatible goods, do not store together in same *fire compartment*.

A Incompatible goods, separate by minimum 1 m horizontal distance.

P Permitted, goods are permitted to be stored together.

DS Refer to Material Safety Data Sheet.

#### Notes to Table 3.2.7.6.:

(1) The numbers refer to the class and division of *dangerous goods* in Table 3.2.7.1.

#### 3.2.7.7. Corrosion Protection

**1)** Measures shall be taken to prevent or minimize corrosion or deterioration of shelving, racks, and piping system components, due to contact with stored *dangerous goods*.

#### 3.2.7.8. Flooring Materials

**1)** Floors in areas where *dangerous goods* are stored shall be constructed of impermeable materials to prevent the absorption of chemicals.

**2)** Class 5 oxidizing substances shall not be stored on combustible floors or platforms.

#### 3.2.7.9. Fire Suppression Systems

**1)** Except as permitted in Sentences (2) and (3) and in Part 4, *buildings* used for the storage of *dangerous goods* regulated by this Subsection shall be equipped throughout with a sprinkler or other fire suppression system, designed in conformance with Part 6 and good engineering practice with respect to specific *dangerous goods*. (See Appendix A.)

**2)** *Buildings* described in Sentence (1) need not be equipped throughout with a sprinkler or other fire suppression system provided that

- the sum of *individual storage areas* in the *building* used for the storage of *dangerous goods*, other than Class 9 *dangerous goods* with no other classification and those covered in Part 4 of this Code, does not exceed 100 m<sup>2</sup>, and
- the *dangerous goods* are
  - separated in conformance with Table 3.2.7.6., and
  - stored in *fire compartments* separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* of not less than 2 h.

**3)** *Buildings* described in Sentence (1) need not be equipped throughout with a sprinkler or other fire suppression system provided that storage consists only of Class 2.2 gas with no Class 5 subsidiary classification.

**4)** Portable extinguishers shall be provided in conformance with Part 6.

**3.2.7.10. Smoke Venting**

1) Where the collective *individual storage areas for dangerous goods* exceed 10 m<sup>2</sup> in a *fire compartment*, means shall be provided for manual or automatic venting of smoke and toxic gases from the storage area under fire conditions. (See Appendix A.)

**3.2.7.11. Spill Control**

1) Measures to control spilled liquid or solid *dangerous goods* shall be provided in conformance with Subsection 4.1.6.

2) Materials or liquids used in cleanup of spills and leakages of *dangerous goods* shall be

- compatible and non-reactive with the *dangerous goods* being cleaned up, and
- disposed of in conformance with Subsection 4.1.6.

**3.2.7.12. Fire Department Access**

1) Except as provided in Sentences (2) and (3), fire department access to *buildings* described in Article 3.2.7.1. shall be in conformance with Section 2.5.

2) When the collective *individual storage area for dangerous goods* exceeds 10 m<sup>2</sup>, *buildings* regulated by Sentence (1) shall be accessible to fire department vehicles from at least 2 sides for the purpose of fire fighting. (See Appendix A.)

3) In *buildings* regulated by Sentence (1), access openings to each *storey* provided in conformance with the Alberta Building Code shall be not less than 750 mm wide by 1 100 mm high. (See Appendix A.)

**3.2.7.13. Labels**

1) Products classified as *dangerous goods* shall display appropriate identifying labels from the time they enter a facility until they are issued as finished products or waste material. (See Appendix A.)

**3.2.7.14. Placards**

1) *Individual storage areas* used for storage of *dangerous goods* shall be clearly designated as such by posted placards conforming to the "Transportation of Dangerous Goods Regulations," and Sentences (2) to (4). (See Appendix A.)

2) Where storage consists of a single product, only the UN Product Identification Number (PIN) need be posted.

3) Where storage consists of multiple products within the same class, the individual class and division placard shall be posted.

4) Where storage consists of more than one class, a placard for each individual class, or the

"Transportation of Dangerous Goods Regulations" Danger symbol shall be posted at the entrance to the storage area.

5) *Individual storage areas* described in Sentence (1) shall be identified in the fire safety plan as required in Article 3.2.2.6.

**3.2.7.15. Training**

1) In a *building* regulated by this Subsection, at least one person shall be

- trained in conformance with Sentence (2),
- in charge during operating hours, and
- available to respond to a day or night emergency.

2) The person in charge specified in Sentence (1) shall be trained in the correct procedures for the handling, storing and offering for transport of *dangerous goods* in accordance with

- the Occupational Health and Safety Act and its Regulations, and
- the "Transportation of Dangerous Goods Regulations."

3) All employees involved in the storage and handling of *dangerous goods* shall be trained in safe handling procedures and correct responses to an emergency situation.

**3.2.7.16. Unauthorized Access**

1) An area used for the storage of *dangerous goods* shall be secured against unauthorized access.

**3.2.7.17. Separation from Combustible Products**

1) *Dangerous goods* and other products described in Sentence 3.2.1.1.(1) shall not be stored in the same *individual storage area*.

**3.2.8. Indoor Storage of Compressed Gases****3.2.8.1. Application**

1) Except as provided in Subsection 3.1.1., this Subsection shall apply to the storage of Class 2 gases inside *buildings*.

**3.2.8.2. Flammable Gases**

1) Except as provided in Sentence (2), cylinders of Class 2.1 flammable gases stored indoors shall be located in a room that

- is separated from the remainder of the *building* by a gas-tight *fire separation* having a *fire-resistance rating* of at least 2 h,
- is located on an exterior wall of the *building*,

### 3.2.8.3.

- c) can be entered from the exterior, and any doors into the interior of the *building* shall be
  - i) equipped with self-closing devices, and
  - ii) constructed so as to prevent migration of gases from the room into other parts of the *building*,
- d) is designed to prevent critical structural and mechanical damage from an internal explosion in conformance with good engineering practice such as described in NFPA 68, "Venting of Deflagrations" (see Appendix A),
- e) is provided with natural or mechanical ventilation in conformance with Subsection 4.1.7.,
- f) does not contain fuel-fired *appliances* or high temperature heating elements, and
- g) is used for no purpose other than the storage of Class 2 gases.

**2)** Cylinders of Class 2.1 flammable, lighter than air gases are permitted to be stored outside of a room described in Sentence (1) provided that

- a) in an unsprinklered *building* of *combustible construction*, the aggregate capacity of expanded gas outside of the room is not more than 60 m<sup>3</sup>, and
- b) in a *sprinklered building* or in a *building* of *non-combustible construction*, the aggregate capacity of expanded gas outside of the room is not more than 170 m<sup>3</sup>.

(See Appendix A.)

### 3.2.8.3. Indoor Storage of Poisonous, Corrosive or Oxidizing Gases

**1)** When stored indoors, cylinders of Class 2.3 poisonous, Class 2.4 corrosive or Class 2.2 (5.1) oxidizing gases shall be located in a room constructed in conformance with the Alberta Building Code.

**2)** Cylinders of gases described in Sentence (1) shall not be stored in a room containing combustible materials.

### 3.2.9. Indoor Storage of Ammonium Nitrate

#### 3.2.9.1. Application

**1)** This Subsection shall apply to the storage of Class 5.1 ammonium nitrate mixtures that contain 60% or more by weight of ammonium nitrate in quantities exceeding 1 000 kg inside *buildings* but does not include fertilizer storage on railways regulated by Transport Canada or on privately operated farms.

#### 3.2.9.2. Clearance from Property Line

**1)** Except as provided in Sentences (2) and (3), the horizontal distance between an ammonium nitrate storage facility and the nearest point of another *building*, structure or property line shall not be less than the following:

- a) 90 m in the case of any school, hospital, hotel, motel, church, theatre, auditorium, sports arena, multi-store shopping centre, apartment or public hall, department store, or merchandise *building* of more than one *storey* in height,
- b) 45 m in the case of a single family dwelling, railway passenger station, railway station dwelling, office *building*, department store, merchandise *building* or restaurant of one *storey* in height,
- c) 30 m in the case of
  - i) any factory, railway shop or other *building* used primarily for manufacturing, processing, maintenance, or repair work, and
  - ii) any office *building* that adjoins a building referred to in Subclause (i) and is associated with it, unless the capacity of the ammonium nitrate storage facility is 181 tonnes or less, in which case the horizontal distance shall be not less than 15 m.

**2)** The horizontal distance between an ammonium nitrate storage facility and the nearest point on the property line of adjoining property owned or leased by a person other than the *owner* of the storage facility shall not be less than the following

- a) 8 m if the capacity of the storage facility does not exceed 181 tonnes,
- b) 15 m if the capacity of the storage facility exceeds 181 tonnes, unless it is of *non-combustible construction* or the adjoining property is occupied by another ammonium nitrate storage facility, in which case the horizontal distance shall be not less than 8 m,
- c) not less than 8 m if the storage facility is of *non-combustible construction* and has a *fire separation* of not less than 1.5 h on the exposed side.

**3)** Notwithstanding the requirements of Sentences (1) and (2), greater safety distances may be imposed on storage facilities located within densely populated areas or other areas considered by the *authority having jurisdiction* to be a special hazard.

#### 3.2.9.3. Storage Buildings

**1)** Except as provided in Article 1.1.2.3. and the Alberta Building Code, ammonium nitrate shall not be stored in *buildings* that

- a) are more than 1 *storey* in *building* height,
- b) contain *basements* or crawl spaces, or
- c) contain open floor drains, tunnels, elevator pits or other pockets which might trap molten ammonium nitrate.

(See Appendix A.)

**2)** *Buildings* and bins containing bulk storage ammonium nitrate shall be designed to prevent contact with material that will cause the ammonium nitrate to become unstable or with material which may corrode or deteriorate by reason of contact with the ammonium nitrate. (See Appendix A.)

**3)** When ammonium nitrate is stored in a *building*, a ventilation system shall be provided to dissipate gases generated by the ammonium nitrate in the event of a fire.

#### 3.2.9.4. Bagged Storage

**1)** Piles of bagged ammonium nitrate shall not exceed

- a) 6 m in height,
- b) 6 m in width, and
- c) 15 m in length.

**2)** Aisles not less than 1 m wide shall be provided in warehouses to separate piles of ammonium nitrate, and at least one aisle not less than 1.2 m wide shall be provided for the entire length of the storage area.

**3)** Bags of ammonium nitrate shall not be stored closer than 400 mm from walls and *partitions* and not closer than 900 mm from a roof, overhead supporting beam or sprinkler head deflector.

**4)** In palletized storage of bagged ammonium nitrate, pallet channels shall be at right angles to aisles.

#### 3.2.9.5. Bin Storage

**1)** Bins in which ammonium nitrate is stored in bulk shall be kept free of materials which may contaminate their contents.

#### 3.2.9.6. Explosives

**1)** Explosives shall not be used to break up caked ammonium nitrate.

#### 3.2.9.7. Sprinkler Systems

**1)** Bagged ammonium nitrate in quantities in excess of 600 000 kg shall be stored only in *buildings sprinklered* in conformance with Article 6.5.1.1.

#### 3.2.9.8. Industrial Trucks

**1)** Fuelling of industrial trucks shall not be carried out in *buildings* in which ammonium nitrate is stored.

**2)** When industrial trucks powered by internal-combustion engines are parked in *buildings* in which ammonium nitrate is stored, they shall be separated from the storage area by *fire separations* having a *fire-resistance rating* of not less than 1 h.

**3)** Industrial trucks transporting ammonium nitrate shall be cleaned of remaining material following use.

#### 3.2.9.9. Fuel-Fired Heating Appliances

**1)** Fuel-fired heating *appliances* shall be separated in conformance with the requirements of the Alberta Building Code from any area in which ammonium nitrate is stored.

### 3.2.10. Indoor Storage of Fireworks

#### 3.2.10.1. Flares

**1)** Articles 3.2.10.2. to 3.2.10.7. do not apply to a person who possesses or discharges *fireworks* commonly used as distress flares.

#### 3.2.10.2. Open Flames

**1)** No person shall smoke in or bring an open flame device or spark producing equipment into any place, site or *building* used for the sale, storage or retail display of *fireworks*.

**2)** Signs reading, "Fireworks – NO SMOKING or OPEN FLAME," in letters at least 100 mm high shall be posted in locations acceptable to the *authority having jurisdiction* in areas described in Sentence (1).

#### 3.2.10.3. Storage

**1)** No person shall store explosives, other than small arms ammunition, in the same *building* in which *fireworks* are stored.

**2)** Quantities of *fireworks* in excess of 100 kg gross weight kept for retail sale shall be stored in a separate area as required by the "Explosives Act" (Canada) and its Regulations.

**3)** No person shall store more than 1 000 kg gross weight of *fireworks* in a *building*.

#### 3.2.10.4. Building

**1)** No person shall sell, offer for sale or store for the purpose of sale *fireworks* in a *building* or place unless the *building* or place is acceptable to the *authority having jurisdiction*.

#### 3.2.10.5. Dwelling Units

**1)** No person shall store more than 10 kg gross weight of *low hazard fireworks* in a *dwelling unit*.

**2)** When *low hazard fireworks* are stored in a *dwelling unit* they shall be stored

- a) in a secure container,

### 3.2.10.6.

- b) in a cool dry area, and
- c) away from
  - i) an open flame,
  - ii) excessive heat, or
  - iii) spark producing equipment or tools.

3) No person shall store *high hazard fireworks* in a *dwelling unit*.

#### 3.2.10.6. Low Hazard Storage

- 1) Low hazard fireworks that are kept for sale shall be kept
- a) separate from other storage and from flammable or combustible substances,
  - b) in a place that is not exposed to direct or refracted sunlight or excessive heat, and
  - c) in an enclosed lockable container as defined in the "Explosives Act" (Canada) and its Regulations, with a capacity of not more than 100 kg in gross weight,
    - i) in packaged lots that do not exceed 25 kg each in gross weight, or
    - ii) in individual lots so that the aggregate gross weight of the lots is less than 100 kg.

2) The enclosed container referred to in Clause (1)(c) shall be clearly and indelibly marked on the outside as to the nature of its contents.

#### 3.2.10.7. High Hazard Storage

1) Where more than 25 kg gross weight of *high hazard fireworks* are stored, they shall be stored in an enclosed container as defined in the "Explosives Act" (Canada) and its Regulations.

2) Where more than 125 kg gross weight of *high hazard fireworks* are stored, they shall be stored in accordance with the "Explosives Act" (Canada) and its Regulations.

3) *High hazard fireworks* obtained for immediate use in accordance with a permit issued pursuant to Article 5.8.1.7. may be stored in quantities in excess of those specified in this Section if the storage place is

- a) situated in a location acceptable to the *authority having jurisdiction*,
- b) secured so as to prevent unauthorized entry,
- c) clean and adequately ventilated,
- d) not used for the storage of any other flammable, combustible or explosive substance, and
- e) posted with conspicuous signs warning of the explosive contents and the danger from open flames, smoking and the use of spark producing tools or other objects in the storage place.

## Section 3.3. Outdoor Storage

### 3.3.1. Scope

#### 3.3.1.1. Application

1) Except as permitted in Sentence (2), this Section shall apply to the short or long term outdoor storage of the following products, whether raw or waste materials, goods in process or finished goods:

- a) Class III and IV commodities, and Group A, B and C plastics, as described in Section 3.2.,
- b) rubber tires,
- c) forest products, including lumber, timber and wood pallets,
- d) forest by-products, including wood chips and hogged material (see Appendix A),
- e) manufactured *buildings* (see Appendix A),
- f) wrecked vehicles in salvage yards, and
- g) *dangerous goods* as described in Subsection 3.3.4.

2) This Section shall not apply to:

- a) a site where the total storage area is not more than 100 m<sup>2</sup>, except for distance requirements between stored products and a *building*,
- b) Class I and II commodities, as classified in Section 3.2.,
- c) intermodal shipping containers, except when containing *dangerous goods* (see Appendix A),
- d) buried products and landfill operations,
- e) products stored on the roof of a *building*,
- f) vehicles in parking areas or parking lots,
- g) logs and similar untreated forest products in ranked piles (see Appendix A), or
- h) bulk products, except as described in Clause (1)(d).

### 3.3.2. General

#### 3.3.2.1. Application

1) Unless otherwise specified, this Subsection shall apply to the outdoor storage of any product covered in this Section.

#### 3.3.2.2. Height

1) Except as required in Subsections 3.3.3., 3.3.4. and 3.3.6., the maximum permitted height of any *individual storage area* shall be determined by its base area, shape and the stability of the stored products.

### 3.3.2.3. Individual Storage Areas and Clearances

1) Except as provided in Sentence (2), the size limits and clearances for *individual storage areas* shall conform to Subsections 3.3.3., 3.3.4. and 3.3.6.

2) An outdoor storage area shall be arranged such that there is a clear space of not less than

- a) 30 m between stored products and brush or forested areas, and
- b) 6 m between stored products and uncontrolled grass or weeds.

### 3.3.2.4. Storage beneath Power Lines

1) Unless acceptable to the *authority having jurisdiction*, products covered in this Section shall not be stored beneath electrical power lines.

### 3.3.2.5. Fire Department Access

1) Except as provided in Sentence (2), an access route constructed in conformance with Subsection 3.2.5. of the Alberta Building Code shall be provided to permit the approach of fire department vehicles to within 60 m travelling distance of any part of an *individual storage area*.

2) Where the total storage area exceeds 6 000 m<sup>2</sup>, the access route required in Sentence (1) shall be connected with a public thoroughfare in at least 2 locations.

### 3.3.2.6. Fencing

1) An outdoor storage area shall be surrounded by a firmly anchored fence that is

- a) substantially constructed to discourage climbing and unauthorized entry,
- b) not less than 1.8 m high, and
- c) provided with gates that shall be locked when the storage area is not staffed.

2) When in a fire department access route, the gates required in Clause (1)(c) shall be of adequate width, design and in such a location as to readily permit the entry of fire department vehicles, in conformance with Article 3.3.2.5. (See Appendix A.)

### 3.3.2.7. Maintenance

1) Any access route, gateway or clear space required in this Section shall be

- a) maintained in conformance with Section 2.5., and
- b) kept free of obstructions and piles of snow.

2) Private hydrants, fire department connections and private valves controlling water supplies to fire protection systems shall be

- a) maintained in conformance with Part 6, and
- b) kept accessible to fire fighters and their equipment at all times.

### 3.3.2.8. Ignition Sources

1) Unless controlled in a manner that will not create a fire hazard, a device, operation or activity that produces open flames, sparks or heat shall not be permitted in an outdoor storage area. (See A-4.1.5.3.(1) in Appendix A.)

2) Except as provided in Subsection 2.4.2., smoking shall not be permitted in an outdoor storage area.

3) Except as provided in Subsection 2.6.2., the burning of materials in an outdoor storage area shall be performed only in a burner that is:

- a) designed, constructed and maintained in conformance with good engineering practice, and
- b) located not less than 15 m from a *building* or stored products.

### 3.3.2.9. Fire Safety Plan

1) A fire safety plan conforming to Section 2.8. and Sentences (2) and (3) shall be prepared.

2) The fire safety plan required in Sentence (1) shall identify

- a) the location and classification of the products currently stored, as described in Sentence 3.3.1.1.(1),
- b) the method of storage, including the clear spaces required and the maximum permitted size of *individual storage areas*,
- c) the location of fire alarm systems and fire fighting equipment, and
- d) the control of fire hazards in and around the outdoor storage area.

3) At least one copy of the fire emergency procedures shall be prominently posted at the outdoor storage site.

### 3.3.2.10. Portable Extinguishers

1) Any *building* located in an outdoor storage area shall be provided with portable extinguishers in conformance with Part 6.

2) Except as required in Sentence 3.3.6.6.(1), each motorized vehicle operating in an outdoor storage area shall be equipped with at least one portable extinguisher having a minimum rating of 2-A:10-B:C and conforming to Part 6.

3) Portable extinguishers conforming to Part 6 shall be provided in all storage areas so that

### 3.3.2.11.

the minimum travel distance from any part of the storage area to an extinguisher is 25 m.

#### 3.3.2.11. Site Preparation

- 1) The storage site shall be
  - a) level, and
  - b) solid ground or paved with asphalt, concrete or other hard surface material.

#### 3.3.2.12. Fuel Dispensing

1) Except as provided in Sentence (2), the dispensing of *flammable liquids* or *combustible liquids* into the fuel tank of a vehicle shall conform to Section 4.5.

2) A clear space of not less than 6 m shall be maintained between the stored products and fuel dispensers.

#### 3.3.2.13. Spill Control

1) Provision shall be made for the safe drainage and containment of waste oils or *dangerous goods* emptied or escaping from stored products under normal storage conditions or in a fire situation, in conformance with Subsection 4.1.6.

#### 3.3.2.14. Fire Separation

1) It is permitted to reduce the clear space between *individual storage areas* prescribed in this Section if a noncombustible *fire separation* or a dirt berm, not less than 1.5 times the height of the stored products, is provided.

#### 3.3.2.15. Fire Protection

1) Where acceptable to the *authority having jurisdiction*, it is permitted to increase the height and size of *individual storage areas* prescribed in this Section if fire extinguishing measures conforming to good engineering practice are provided in addition to the requirements of Article 3.3.2.16.

#### 3.3.2.16. Water Supply

1) Except as required in Sentence (2), water supplies for fire fighting shall be available from

- a) a public or private water system, or
- b) water supplies that conform to the requirements of NFPA 1231, "Water Supplies for Suburban and Rural Firefighting." (See Appendix A.)

2) Other methods acceptable to the *authority having jurisdiction* may be used to supply water to a storage area in lieu of the water supplies specified in Sentence (1).

3) The water supply system shall be capable of supplying water for a period of not less than 3 h at a minimum rate of

- a) at least 4 000 L/min if the storage area is less than 600 m<sup>3</sup>, or
- b) at least 8 000 L/min if the storage area is equal to or greater than 600 m<sup>3</sup>.

4) On-site storage of at least 300 m of 65 mm hose and sufficient nozzles shall be provided if not immediately available from responding public fire departments.

5) Water supply required in Sentences (1) and (2) shall be available so that any part of the storage area can be reached by using not more than 150 m of hose.

#### 3.3.2.17. Hydrant Systems

1) Except as required in Sentence (2), where a municipal hydrant system exists and is adjacent to the storage yard, the hydrant system shall be extended into the yard area so that all parts of the yard can be reached by using not more than 60 m of hose.

2) Where acceptable to the *authority having jurisdiction*, fire protection may be provided by municipal *street* hydrants and mobile pumping equipment. (See Appendix A.)

### 3.3.3. General Outdoor Storage

#### 3.3.3.1. Application

1) This Subsection applies to the outdoor storage of products other than *dangerous goods*.

#### 3.3.3.2. Individual Storage Areas and Clearance

1) Except as provided in Sentences (2) to (4), the size and clearances for *individual storage areas* shall conform to Table 3.3.3.2. (See Appendix A.)

2) Except as permitted in Sentences (3) and (4), a clear space of not less than 15 m shall be maintained between stored products and a *building* on the same property.

**Table 3.3.3.2.**  
**Size and Clearances for Individual Storage Areas (ISA)**  
 Forming Part of Sentence 3.3.3.2.(1)

Product Classification <sup>(1)</sup>	Max. Base Area, m <sup>2</sup>	Max. Height of Storage, m	Min. Clear Space Around Each ISA, m
Class III and IV commodities, Group A, B and C plastics, lumber, timber, manufactured buildings, wrecked vehicles	1 000 1 000	≤ 3 > 3 but ≤ 6	6 twice the height of storage
Wood chips, hogged material <sup>(2)</sup>	15 000	18	9
Rubber tires, <sup>(3)</sup> combustible pallets	1 000	3	15

**Notes to Table 3.3.3.2.:**

(1) See Sentence 3.3.1.1.(1).

(2) See A-3.3.1.1.(1)(d) in Appendix A.

(3) See Subsection 3.3.6. for Outdoor Storage of Used Tires.

- 3)** It is permitted to waive the clearance required in Sentence (2) if
- a) the stored products do not consist of wood chips, hogged material, rubber tires or combustible pallets,
  - b) the exposed wall of the *building* is a *fire separation* having a *fire resistance rating* of not less than 2 h, and
  - c) the stored products are separated from any unprotected wall opening by a horizontal distance of not less than
    - i) 3 m on either side of the opening, and
    - ii) 6 m perpendicularly in front of the opening.

**4)** It is permitted to waive the clearance required in Sentence (2) if an *individual storage area* has a base area not greater than 5 m<sup>2</sup>.

### 3.3.4. Outdoor Storage of Dangerous Goods

#### 3.3.4.1. Application

**1)** Except as provided in Part 4 or otherwise specified in this Code, this Subsection applies to the outdoor storage of *dangerous goods* in packages or containers.

**2)** The storage of *dangerous goods* in quantities greater than those shown in Table 3.2.7.1., in a single *individual storage area*, shall conform to this Subsection.

**3)** When a product has a primary and a subsidiary classification, the quantities referred to in Sentence (2) shall be determined by

- a) using the classification having precedence as established in Schedule I of Section 3.8. of the "Transportation of Dangerous Goods Regulations," or

- b) using the lesser of the two small quantity exemptions in Table 3.2.7.1. when the precedence referred to in Clause (a) is not established.

#### 3.3.4.2. Individual Storage Areas and Clearances

**1)** Except as provided in Sentences (2) and (3), the size of an *individual storage area* for *dangerous goods* shall be not greater than 1 000 m<sup>2</sup>.

**2)** A clear space of not less than 6 m shall be provided around each *individual storage area* for *dangerous goods*. (See A-3.3.3.2.(1) in Appendix A.)

**3)** *Dangerous goods* shall not be stored to a height greater than 6 m.

#### 3.3.4.3. Separation from Other Dangerous Goods

**1)** Except as provided in Sentence (2), *dangerous goods* shall be separated from other *dangerous goods* in conformance with Article 3.2.7.6.

**2)** Incompatible *dangerous goods* that are not allowed in Table 3.2.7.6. to be stored in the same *fire compartment* are permitted to be separated by a minimum horizontal distance of 3 m in lieu of a fire separation when in an outdoor storage area.

#### 3.3.4.4. Separation from Combustible Products

**1)** *Dangerous goods* and other products described in Sentence 3.3.1.1.(1) shall not be stored in the same *individual storage area*.

#### 3.3.4.5. Identification

**1)** The outdoor storage of *dangerous goods* shall conform to Articles 3.2.7.13. and 3.2.7.14.

## 3.3.4.6.

### 3.3.4.6. Training

1) The training of personnel involved in the outdoor storage of *dangerous goods* shall conform to Article 3.2.7.15.

### 3.3.4.7. Safety Precautions

1) When *dangerous goods* are stored outside of a *building*, safety precautions shall be taken to prevent undesirable reactions from the effects of atmospheric conditions.

2) Damaged or leaking packages or containers of *dangerous goods* shall be moved to a safe location and the product repackaged and labelled as soon as possible.

### 3.3.4.8. Intermodal Shipping Containers

1) Intermodal shipping containers used for the transportation of *dangerous goods* shall be stored in conformance with the segregation requirements in Section 15 of the "International Maritime Dangerous Goods Code," of the International Maritime Organization. (See A-3.3.1.1.(2)(c) in Appendix A.)

## 3.3.5. Outdoor Storage of Compressed Gases

### 3.3.5.1. Application

1) Except as provided in Subsection 3.1.1., this Subsection shall apply to the storage of Class 2 gases outside *buildings*.

### 3.3.5.2. Location

- 1) Where cylinders of Class 2 gases are stored outdoors, they shall be
- a) supported on raised concrete or other noncombustible platforms, and
  - b) located in an enclosure fenced in conformance with Article 3.3.2.6.

### 3.3.5.3. Clearances

- 1) Except as provided in Sentence (2), cylinders of Class 2.1 flammable, Class 2.3 poisonous or Class 2.4 corrosive gases stored outdoors shall be not less than
- a) 1.5 m from any *building* opening, if the aggregate capacity of expanded gas is not more than 170 m<sup>3</sup>,
  - b) 7.5 m from any *building* opening, if the aggregate capacity of expanded gas is more than 170 m<sup>3</sup> but less than 500 m<sup>3</sup>, and
  - c) 15 m from any *building* opening, if the aggregate capacity of expanded gas is 500 m<sup>3</sup> or more.

(See A-3.2.8.2.(2) in Appendix A.)

2) The distances required in Sentence (1) need not apply when the opening referred to is into

a room conforming to Subsection 3.2.8. which is used for storing Class 2 gases.

## 3.3.6. Outdoor Storage of Used Tires

### 3.3.6.1. Application

1) This Subsection shall apply to the outdoor storage of tires or shredded tires where the bulk volume of stored product exceeds 300 m<sup>3</sup>. (See Appendix A.)

### 3.3.6.2. Covered Storage

- 1) This Subsection shall not apply to the storage of tires or shredded tires
- a) that are covered by a minimum depth of 150 mm of non-combustible material, or
  - b) buried in a lined and covered trench system for recovery and reuse.
- (See Appendix A.)

### 3.3.6.3. Pile Size and Location

- 1) No person shall store or permit to be stored, tires or shredded tires in outdoor storage piles that exceed
- a) an individual pile volume of 300 m<sup>3</sup>,
  - b) an *individual storage area* of 100 m<sup>2</sup>, or
  - c) a storage pile height of 3 m.
- 2) No person shall store tires or shredded tires unless clearances from other stored product or salvage, including but not limited to tires, is maintained
- a) with a clear space of not less than 6 m,
  - b) with at least 15 m from surrounding property lines, and
  - c) with at least 15 m from buildings or as indicated in NFPA 80A, "Protection of Buildings from Exterior Fire Exposures," whichever is the greatest distance.

3) Storage piles shall not be located beneath electrical power lines.

### 3.3.6.4. Fire Break

1) A 22 m fire break shall be provided around the perimeter of individual storage piles where the total bulk volume of stored tires or shredded tires is greater than 4 800 m<sup>3</sup>.

### 3.3.6.5. Open Flame

1) No person shall smoke or use an open flame *appliance* or device, including welding or cutting equipment in a storage area.

### 3.3.6.6. Fuel-fired Vehicles

1) Fuel-fired vehicles operating in a storage area shall be

- a) maintained regularly so as to not be a fire hazard, and
- b) equipped with at least one 2-A:20-B:C portable fire extinguisher.

#### **3.3.6.7. Fire Safety Plan**

- | **1)** Except as provided in Sentence (2), emergency planning measures conforming to Section 2.8. shall be provided for storage areas described in Article 3.3.6.1.
- | **2)** The fire safety plan required as part of the emergency planning measures described in Sentence (1) shall be retained on site for reference by the *authority having jurisdiction* and the fire department.
- | **3)** Access to heavy-duty equipment such as bulldozers, front-end loaders and similar equipment shall be included in the fire safety plan.

#### **3.3.6.8. Fire Department Access Routes**

- | **1)** A minimum of two fire department access routes conforming to Subsection 2.5.1., located as remotely as possible from each other, shall be provided for each tire storage area.
- | **2)** A fire access route shall be provided within 50 m of any point in the storage yard where storage piles are located, and not closer than 6 m to any individual storage pile.

#### **3.3.6.9. Fencing**

- | **1)** Where the total bulk of stored tires or shredded tires is more than 600 m<sup>3</sup>, the area occupied by the tires shall be fenced in conformance with Article 3.3.2.6.

#### **3.3.6.10. Maintenance**

- | **1)** Storage areas shall be maintained free of combustible ground vegetation, including grass and weeds, for at least 4.5 m from the stored material and not less than 30 m from brush and forested areas.



# Part 4

## Flammable and Combustible Liquids

### Section 4.1. General

#### 4.1.1. Scope

##### 4.1.1.1. Application

**1)** Except as provided in Sentences (2) and (3), this Part provides for the storage, handling, use and processing of *flammable liquids* and *combustible liquids* in *buildings*, structures and open areas. (See Appendix A.)

**2)** Areas in *process plants*, where conditions must be addressed by design and operational details specific to the hazard, need not conform to this Part, where alternative protection is provided in conformance with Part 1. (See Appendix A.)

- 3)** This Part shall not apply to
- a) the transportation of *flammable liquids* or *combustible liquids* under the "Transportation of Dangerous Goods Regulations,"
  - b) *appliances* and their ancillary equipment within the scope of CAN/CSA-B139-M "Installation Code for Oil Burning Equipment" (see Appendix A),
  - c) the storage of *flammable liquids* or *combustible liquids* on farms for individual farm use and on isolated construction projects (see Appendix A),
  - d) the storage of aerosol products covered under Subsection 3.2.5.,
  - e) liquefied petroleum gas-burning *appliances* and equipment within the scope of the gas regulations made pursuant to the Safety Codes Act,
  - f) the production, storage or handling of liquefied natural gas within the scope of the gas regulations made pursuant to the Safety Codes Act,
  - g) liquids such as certain halogenated hydrocarbons and mixtures containing hydrocarbons which are without *flash points* but which may be flammable under certain conditions, or
  - h) the storage and handling of raw production *flammable liquids* or *combustible liquids* and the incidental storage and handling of hydrocarbon-based chemicals resulting from or used during crude oil

or natural gas exploration, production or transmission as mandated under the scope of ERCB Guide G-55, "Storage Requirements for the Upstream Petroleum Industry."

**4)** In addition to the requirements in this Part, the storage, handling and use of *flammable liquids* and *combustible liquids* in laboratories shall be in conformance with Section 5.7.

**5)** Unless otherwise specified, this Section shall apply to all areas involved in the storage, handling or use of *flammable liquids* and *combustible liquids* covered in this Part.

##### 4.1.1.2. Approval

**1)** Only individuals *approved* by the *Administrator* are permitted to install, remove, repair or conduct precision tests of *storage tank systems*. (See Appendix A.)

**2)** No person shall install or alter any *storage tank system* referred to in this Part, unless

- a) required permits or approvals have been obtained from the *authority having jurisdiction*,
- b) plans, drawings and specifications of the system or equipment have been examined by the *authority having jurisdiction*, and
- c) the plans, drawings and specifications referred to in Clause (b) bear the stamp and seal of a professional engineer licensed to practice in the province of Alberta.

##### 4.1.1.3. Registration

(See A-4.1.1.2.(1) in Appendix A.)

- 1)** This Article does not apply to
- a) an aboveground *storage tank* with a capacity of less than 2500 L,
  - b) a *storage tank* in an industrial *process plant*, a *refinery* or a *distillery*,
  - c) a flow-through *storage tank* used as part of the process of an industrial plant, *refinery* or *distillery*,
  - d) aboveground *storage tanks* that are used at a temporary location for less than 1 year, or

### 4.1.2.1.

- e) a *pressure vessel* that is used as a *storage tank* and is registered in accordance with the boiler and pressure vessel regulations made pursuant to the Safety Codes Act.

**2)** No person shall use a *storage tank* unless the tank is registered under this Article.

**3)** An application for registration shall be submitted to the *Administrator*.

**4)** Where a *storage tank* is divided into two or more compartments, each compartment is considered a separate part of the *storage tank system* and shall be registered separately.

**5)** On receipt of a completed application, the *Administrator* shall register the *storage tank* and issue a registration certificate provided the *storage tank system* is in compliance with all applicable requirements of this Code.

**6)** The *owner* of the *storage tank* shall ensure that the registration certificate required by Sentence (5) is displayed on the premises where the *storage tank* is located.

- 7)** A registration certificate
- a) expires on the anniversary of the date of issue and is renewable for an additional year on application to the *Administrator*,
  - b) is valid only while the *storage tank* remains at the location described in the certificate, and
  - c) is not transferable.

**8)** Except for *storage tanks* being withdrawn from service in accordance with Section 4.10., no person shall deliver or remove *flammable liquids* or *combustible liquids* to or from a *storage tank*, unless

- a) the *storage tank* is registered under this Article, and
- b) the registration certificate is displayed as required by Sentence (6).

**9)** The *owner* of a *storage tank* shall ensure that a record is kept at the premises where the *storage tank* is located or made available to the *authority having jurisdiction* within 2 working days that indicates

- a) the location of the *storage tank*,
- b) the product to be stored in the *storage tank*,
- c) the capacity of the *storage tank*,
- d) the material from which the *storage tank* is constructed,
- e) the type of corrosion protection, if any, applied to the *storage tank*, and
- f) the records of any leak tests performed on the *storage tank*.

**10)** The *owner* shall make the record described in Sentence (9) available to the *authority having jurisdiction* when requested to do so.

**11)** The *Administrator* may cancel the registration of a *storage tank* under this Article if

- a) the *Administrator* has reasonable grounds to suspect that the *storage tank* is leaking,
- b) the *storage tank* is out of service as described in Subsections 4.10.2. or 4.10.3.,
- c) the *storage tank* has not been installed in accordance with this Part or upgraded in accordance with Subsection 4.3.17., or
- d) the information given on an application for registration is found to be incorrect.

**12)** When the registration of a *storage tank* is cancelled or the *storage tank* is permanently taken out of service or removed, the *owner* shall return the registration certificate to the *Administrator* within 30 days.

**13)** The *owner* of a *storage tank* shall forthwith notify the *Administrator* if a registration certificate is lost, stolen or destroyed.

**14)** Upon receiving notification from an *owner* that a registration certificate has been lost, stolen or destroyed, the *Administrator* shall issue a replacement.

**15)** Where a registered *storage tank* is replaced, materially modified, or altered to satisfy an upgrading requirement of Subsection 4.3.17., the *owner* shall apply for a new registration certificate in accordance with Sentence (3) within 30 days after substantial completion of the modifications, alterations, or replacement.

**16)** The *owner* of a *storage tank* shall notify the *Administrator*, in writing, of the sale, lease or other transfer of ownership or any relocation of a *storage tank*.

**17)** Upon receipt of satisfactory evidence of the sale, lease, or other transfer of ownership or any relocation of a *storage tank*, as described in Sentence (16), the *Administrator* may issue a new registration certificate that reflects the new ownership or the new location.

## 4.1.2. Classification

### 4.1.2.1. Classification

(See Appendix A.)

**1)** For the purposes of this Part, *flammable liquids* and *combustible liquids* shall be classified in conformance with Sentences (2) and (3).

**2)** *Flammable liquids* shall be Class I liquids, and shall be subdivided into:

- a) Class IA liquids, which shall include those having a *flash point* below 22.8°C and a boiling point below 37.8°C,
- b) Class IB liquids, which shall include those having a *flash point* below 22.8°C and a boiling point at or above 37.8°C, and

- c) Class IC liquids, which shall include those having a *flash point* at or above 22.8°C and below 37.8°C.

**3)** *Combustible liquids* shall be Class II or Class IIIA liquids, and shall be subdivided into:

- a) Class II liquids, which shall include those having a *flash point* at or above 37.8°C and below 60°C, and
- b) Class IIIA liquids, which shall include those having a *flash point* at or above 60°C and below 93.3°C (see Appendix A).

#### 4.1.2.2. Heated Liquids

**1)** When a liquid having a *flash point* at or above 37.8°C, is being processed, stored, handled or used at a temperature at or above its *flash point*, it shall be treated as a Class I liquid.

#### 4.1.2.3. Used Lubricating Oil

(See Appendix A.)

**1)** Except as provided in Sentence (2), used lubricating oil drained from motor vehicles shall be classified as a Class IIIA liquid.

**2)** When Class I or II liquids are added to used oils referred to in Sentence (1), the resulting mixture shall be classified by tests conforming to Subsection 4.1.3.

**3)** Except as provided in Sentences (4), (5) and (6), the storage and handling of used lubricating oil shall conform to the appropriate requirements for the storage and handling of *combustible liquids* contained in this Part.

**4)** A pipe to convey used lubricating oil is permitted to extend inside a *building* provided that such pipe is equipped with a trap and extends to the lowest point in a used oil *storage tank*.

**5)** Used lubricating oil *storage tanks* shall be equipped with removable suction tubes with leak-tight couplings. (See Appendix A.)

**6)** Used lubricating oil *storage tanks* located outside *buildings* are exempt from the requirements for overfill prevention.

#### 4.1.3. Flash Point

##### 4.1.3.1. Determination of Flash Point

(See Appendix A.)

**1)** Except as provided in Sentences (3) and (4), the *flash point* of liquids having a viscosity less than 6 mm<sup>2</sup>/s at 37.8°C and a *flash point* below 93.3°C shall be determined in conformance with ASTM D 56, "Flash Point by Tag Closed Tester."

**2)** Except as provided in Sentences (3) and (4), the *flash point* of liquids having a viscosity of 6 mm<sup>2</sup>/s or more at 37.8°C or a *flash point* of 93.3°C

or higher shall be determined in conformance with ASTM D 93, "Flash Point by Pensky-Martens Closed Tester."

**3)** ASTM D 3828, "Flash Point by Small Scale Closed Tester" is permitted to be used for testing aviation turbine fuels within the scope of this procedure.

**4)** ASTM D 3278, "Flash Point of Liquids by Setaflash Closed-Cup Apparatus" is permitted to be used for paints, enamels, lacquers, varnishes and related products and their components having *flash points* between 0°C and 110°C, and having a viscosity less than 15 000 mm<sup>2</sup>/s (150 stokes) at 25°C.

#### 4.1.4. Electrical Installations

##### 4.1.4.1. Hazardous Locations

**1)** Electrical equipment in a location where *flammable liquids* or *combustible liquid* vapours are present shall conform to electrical regulations made pursuant to the Safety Codes Act. (See Appendix A.)

#### 4.1.5. Fire Prevention and Protection

##### 4.1.5.1. Portable Extinguishers

**1)** Portable extinguishers shall be provided and maintained as required elsewhere in this Part and in Part 6.

##### 4.1.5.2. Additional Fire Protection Equipment

**1)** In addition to extinguishers required in Article 4.1.5.1., fire protection equipment shall be provided where there are special hazards of operation, dispensing or storage.

##### 4.1.5.3. Ignition Sources

**1)** Unless controlled in a manner that will not create a fire or explosion hazard, a device, operation or activity that produces open flames, sparks or heat shall not be permitted in an area described in Article 4.1.1.1. (See Appendix A.)

##### 4.1.5.4. Smoking

**1)** Except for designated safe smoking areas conforming to Subsection 2.4.2., smoking shall not be permitted in areas described in Article 4.1.1.1.

**2)** Signs conforming to Article 2.4.2.2. shall be prominently posted in areas where smoking is prohibited.

##### 4.1.5.5. Removal of Combustibles

**1)** Areas described in Article 4.1.1.1. shall be kept clean and free of ground vegetation and

## 4.1.5.6.

accumulations of combustible materials not essential to operations.

**2)** Cleaning rags shall be stored in receptacles conforming to Article 2.4.1.3.

### 4.1.5.6. Emergency Planning

**1)** Except as provided in Sentence (2), emergency planning measures conforming to Section 2.8. shall be provided for all *buildings*, parts of *buildings* and open areas described in Article 4.1.1.1.

**2)** The fire safety plan required as part of the emergency planning measures in Sentence (1) shall be retained on site for reference by the *authority having jurisdiction* and personnel.

### 4.1.5.7. Access for Fire Fighting

**1)** Required aisles and other access paths shall be maintained to permit the unobstructed movement of personnel and fire department apparatus so that fire fighting operations can be carried out in any part of an area used for the storage, use or handling of *flammable liquids* or *combustible liquids*.

### 4.1.5.8. Hot Works

**1)** Hot works shall be performed in conformance with Section 5.2.

### 4.1.5.9. Basement Storage

(See Appendix A.)

**1)** Except as permitted in Sentence (2) and in *dwelling units* as described in Article 4.2.4.5., and in *mercantile occupancies* as described in Sentence 4.2.5.2.(3), Class I liquids shall not be stored, handled or used in *basements* or pits.

**2)** Not more than 5 L of Class I liquid is permitted to be stored in *basements*, provided it is stored in safety containers conforming to ULC/ORD-C30, "Safety Containers."

## 4.1.6. Spill Control and Drainage Systems

### 4.1.6.1. Spill Control

**1)** A spill of *flammable liquids* or *combustible liquids*, including water used for fire fighting purposes, shall be prevented from flowing outside of the spill area and from reaching waterways, sewer systems and potable water sources by

- a) constructing a noncombustible barrier of sufficient height to contain the spill, or
- b) grading the site or sloping the floor to divert the spill to a drainage system conforming to Article 4.1.6.2.

(See Appendix A.)

**2)** When barriers required in Sentence (1) are provided to contain accidental spillage from aboveground *storage tanks*, they shall conform to the requirements for secondary containment in Subsection 4.3.7.

**3)** No person shall dump, dispense, discard, or otherwise dispose of *flammable liquids* or *combustible liquids* into a sewer.

### 4.1.6.2. Drainage Systems

**1)** A drainage system referred to in Clause 4.1.6.1.(1)(b) shall

- a) terminate at a location where such spill will not create a fire hazard or any risk to public health or safety, and
- b) direct the spill away from *buildings*, *means of egress*, fire department access roadways, or valves controlling the flow of *flammable liquids* or *combustible liquids* or water supplies for fire fighting.

**2)** Closed drainage systems shall be equipped with a trap. (See Appendix A.)

### 4.1.6.3. Spills and Leaks

**1)** Maintenance and operating procedures shall be established to prevent the escape of *flammable liquids* or *combustible liquids* to areas where they would create a fire or explosion hazard.

**2)** Except as provided in Sentence (3), all reasonable steps shall be taken to recover escaped liquid and to remove or treat the contaminated soil. (See Appendix A.)

- 3)** Liquid spilled or leaked shall be
  - a) flushed to a location conforming to Article 4.1.6.2., or
  - b) removed with the aid of an absorbent conforming to Sentence (4), and
    - i) deposited in a receptacle conforming to Article 2.4.1.3., or
    - ii) disposed of in a manner that does not create a fire or explosion hazard.

**4)** An absorbent required in Sentence (3) shall

- a) be noncombustible, or
- b) conform to ULC/ORD-C410A, "Absorbents for Flammable and Combustible Liquids."

**5)** When a loss of *flammable liquid* or *combustible liquid* occurs from a spill or leak, the *owner* shall ensure that

- a) appropriate action is taken as required in Sentences (2) and (3), and
- b) the fire department and the *authority having jurisdiction* are notified forthwith if the quantity of liquid spilled or leaked
  - i) exceeds 50 L in aggregate, or

ii) is sufficient to cause a sheen on nearby surface water.  
(See Appendix A.)

**6)** *Flammable liquids and combustible liquids* that are to be disposed of as waste shall be stored in a *storage tank* or *closed container* conforming to this Part until removed from the premises.

## 4.1.7. Ventilation

### 4.1.7.1. Rooms or Enclosed Spaces

**1)** Where *flammable liquids and combustible liquids* are processed, handled, stored, dispensed or used within rooms or enclosed spaces, ventilation shall conform to this Part, and the Alberta Building Code. (See Appendix A.)

### 4.1.7.2. Ventilation Measures

**1)** Except as permitted in Sentence (2), a room or enclosed space referred to in Article 4.1.7.1. shall be provided with one of the following ventilation systems:

- a) continuous mechanical ventilation where Class I liquids are processed, dispensed or used in a manner that releases flammable vapours into the room or enclosed space,
- b) either natural or continuous mechanical ventilation where
  - i) Class I liquids are stored, processed, dispensed or used in a manner that does not release flammable vapours into the room or enclosed space, or
  - ii) Class II liquids are processed, dispensed or used.

**2)** Ventilation referred to in Clause (1)(b) need not be provided for the storage of Class I liquids if

- a) storage consists of only *closed containers*, and
- b) no dispensing operations are performed.

**3)** Ventilation required in Sentence (1) shall be sufficient to ensure that flammable vapour concentrations outside the zone identified as Class I, Division 1 in conformance with Article 4.1.4.1., do not exceed 25% of the *lower explosive limit* of the flammable vapour. (See Appendix A.)

**4)** Where a mechanical ventilation system is installed to meet the conditions of Sentence (3), it shall be capable of exhausting at least 18 m<sup>3</sup>/h per square metre of room area, but not less than 250 m<sup>3</sup>/h.

**5)** Where continuous mechanical ventilation is installed in order to meet the conditions of Sentence (1), it shall

- a) be provided with automatic interlocks so that the activity generating flammable

vapours cannot be performed when the ventilation system is not in operation, and sound an audible alarm in an attended area upon shut-down of the ventilation system.

### 4.1.7.3. Location of Air Inlets and Outlets

**1)** Ventilation air inlets and outlets within a room or enclosed space referred to in Article 4.1.7.1. shall be arranged in conformance with Sentences (2) to (4).

**2)** Where the flammable vapour being removed is heavier than air,

- a) at least one air inlet shall be located at a point near a wall, and no higher than 300 mm from the floor, and
- b) at least one air outlet shall be located near the opposite wall, no higher than 300 mm from the floor.

**3)** Where the flammable vapour being removed is lighter than air,

- a) at least one air inlet shall be located at a point near a wall, and no lower than 300 mm from the ceiling, and
- b) at least one air outlet shall be located near the opposite wall, no lower than 300 mm from the ceiling.

**4)** When the average air velocity in the room exceeds 0.5 m/s, make-up air shall be provided in conformance with Article 4.1.7.5.

### 4.1.7.4. Location of Mechanical Ventilation Exhaust Air Outlets

**1)** Except as provided in Article 4.1.7.6., the exhaust air outlet from a mechanical ventilation system required in Article 4.1.7.2. shall be

- a) located outdoors, not less than 3 m from any *building* opening, and
- b) arranged so that the exhaust air does not discharge toward any unprotected opening within 7.5 m of the discharge point.

### 4.1.7.5. Make-up Air

**1)** Where make-up air for a mechanical ventilation system is taken from within the *building*, the opening into the room or enclosed space shall be provided with a *fire damper*.

**2)** Make-up air for a natural or mechanical ventilation system shall be taken from a point remote from any exhaust air discharge described in Article 4.1.7.4.

**3)** Make-up air for a natural ventilation system shall be taken from a point outside the *building*.

## 4.1.7.6.

### 4.1.7.6. Recirculating Ventilation Systems

1) Where a mechanical ventilation system is installed in conformance with Article 4.1.7.2., and where exhaust air is recirculated, a fail-safe vapour detection and alarm system shall be provided

- a) to continuously monitor the flammable vapour concentration in the exhaust air, and
- b) if the vapour concentration in Clause (a) exceeds 25% of the *lower explosive limit* of the vapour, to
  - i) sound an alarm,
  - ii) stop the recirculation of air, and
  - iii) redirect the exhaust air to an outdoor location.

### 4.1.7.7. Exclusive Use of Ducts

1) Ducts used in a ventilation system conforming to Article 4.1.7.2. shall not be used for any other ventilation or exhaust system.

### 4.1.7.8. Maintenance

1) Inlet and exhaust openings and associated ducts shall be kept free of any obstructions that may interfere with the operation of the ventilation system.

## 4.1.8. Handling of Flammable and Combustible Liquids

### 4.1.8.1. Containers and Storage Tanks

1) All *flammable liquids* and *combustible liquids* shall be stored in containers conforming to Subsection 4.2.3. or in *storage tanks* conforming to Subsection 4.3.1.

2) Containers and *storage tanks* for *flammable liquids* or *combustible liquids* shall be kept closed when not in use.

### 4.1.8.2. Control of Static Electric Charge

- 1) When Class I liquids are dispensed from or into a container or a *storage tank*,
  - a) if made of metallic or electrically conducting material, such container or tank shall be electrically connected to the fill stem, or rest on a conductive floor that is electrically connected to the fill stem, or
  - b) if the container or tank is made of non-electrically conducting material, measures shall be taken to minimize the potential for static electric charge to develop (see Appendix A).
- 2) Except as provided in Sentence (3), when Class I liquids are transferred into a *storage tank* through the top of the tank, the fill pipe shall terminate within 150 mm of the bottom of the tank.
- 3) Sentence (2) shall not apply when

- a) the *storage tank* vapour space cannot exceed 25% of the *lower explosive limit* or is filled with an inert gas that prevents the ignition of the vapour mixture, or
- b) the liquid being transferred has a minimum conductivity that prevents the accumulation of static electricity. (See Appendix A.)

4) Fill pipes referred to in Sentence (2) shall be installed in such a way as to minimize vibration of the pipe.

### 4.1.8.3. Transfer

1) Class I liquids shall be drawn from or transferred into containers or *storage tanks* within a *building*

- a) through a piping or transfer system conforming to Section 4.4.,
- b) by means of a pump designed in conformance with good engineering practice on top of the container or *storage tank*, or
- c) by gravity through a self-closing valve designed in conformance with good engineering practice.

(See Appendix A.)

2) Except as provided in Subsection 4.4.10., the transfer of *flammable liquids* or *combustible liquids* by means of pneumatic pressure applied to a container or *storage tank* shall not be permitted.

### 4.1.8.4. Fuel Tanks of Vehicles

1) When acceptable to the *authority having jurisdiction*, it is permitted to use movable tanks for dispensing *flammable liquids* or *combustible liquids* into the fuel tanks of vehicles or other motorized equipment provided such movable tanks are used in conformance with the requirements of this Part. (See Appendix A.)

2) Only enclosed pumping equipment designed in conformance with good engineering practice shall be used to transfer Class I liquids to or from the fuel tanks of vehicles inside *buildings*. (See A-4.1.8.3.(1) in Appendix A.)

## Section 4.2. Container Storage and Handling

### 4.2.1. Scope

#### 4.2.1.1. Application

1) Except as provided in Sentence (2), this Section shall apply to the storage, handling and use of *flammable liquids* or *combustible liquids* in

- a) containers conforming to Clauses 4.2.3.1.(1)(a) to (d) having a capacity of not more than 230 L, or
- b) portable tanks conforming to Clause 4.2.3.1.(1)(e) having an individual capacity of not more than 2 500 L.

**2)** Except as otherwise stated in this Code, this Section shall not apply to

- a) *fuel dispensing stations*, bulk plants, *refineries* and *distilleries*,
- b) liquids in the fuel tank of motors or engines,
- c) *distilled beverage alcohol* in closed containers when stored in conformance with Part 3,
- d) food and pharmaceutical products when in closed containers having a capacity of not more than 5 L, or
- e) products containing not more than 50% by volume of water-miscible *flammable liquids* or *combustible liquids* with the remainder of the solution being non-flammable, when in closed containers having a capacity of not more than 5 L.

**3)** Portable tanks having a capacity greater than 2 500 L shall be installed in conformance with Section 4.3.

**4)** For the purpose of this Section, *unstable liquids* shall meet the requirements for Class IA liquids.

**5)** Except as otherwise stated, requirements for containers in this Part shall also apply to portable tanks described in Sentence (1).

## 4.2.2. General

### 4.2.2.1. Prohibited Locations

**1)** *Flammable liquids* or *combustible liquids* shall not be stored in or adjacent to *exits*, elevators or principal routes that provide *access to exits*.

### 4.2.2.2. Storage Arrangement

**1)** In addition to the provisions of this Section, the method of storage of *flammable liquids* and *combustible liquids* shall be determined to ensure stability of the stored products.

### 4.2.2.3. Separation from Other Dangerous Goods

**1)** Except as provided in Sentence (2), *flammable liquids* and *combustible liquids* shall be separated from other *dangerous goods* in conformance with Sections 3.2. and 3.3.

**2)** For the purposes of applying Table 3.2.7.6., Class IIIA liquids shall be treated as Class 3 *dangerous goods*. (See Appendix A.)

## 4.2.3. Containers and Portable Tanks

### 4.2.3.1. Design and Construction

**1)** Except as permitted in Articles 4.2.3.3. and 4.2.3.4., containers and portable tanks for *flammable liquids* or *combustible liquids* shall be built in conformance with the following:

- a) the "Transportation of Dangerous Goods Regulations,"
- b) CSA B376-M, "Portable Containers for Gasoline and Other Petroleum Fuels,"
- c) CSA B306-M, "Portable Fuel Tanks for Marine Use,"
- d) ULC/ORD-C30, "Safety Containers," or
- e) Section 6 of CSA B620, "Highway Tanks and Portable Tanks for the Transportation of Dangerous Goods."

### 4.2.3.2. Markings or Labels

**1)** Except as provided in Sentence (2) and Article 4.2.3.1., containers for *flammable liquids* or *combustible liquids* shall be distinctly marked or labelled in easily legible type which is in contrast to any other printed matter on the label with a warning to indicate that

- a) the material in the container is flammable,
- b) it should be kept away from heat, sparks and open flames, and
- c) it should be kept closed when not in use.

**2)** Markings referred to in Sentence (1) are not required when the container is labelled in conformance with

- a) the "Transportation of Dangerous Goods Act" and its Regulations,
- b) the "Hazardous Products Act" and its Regulations, or
- c) the "Pest Control Products Act" and its Regulations.

### 4.2.3.3. Plastic and Glass Containers

**1)** Except as permitted in Article 4.2.3.4., the storage, handling and use of *flammable liquids* or *combustible liquids* in a glass or plastic container shall be permitted only if the required liquid purity would be affected by storage in a metal container or if the liquid would cause excessive corrosion of the metal container.

### 4.2.3.4. Other Containers

**1)** Except as permitted in Sentences (2) and (3), the storage and use of Class I or II liquids, in containers other than those described in Article 4.2.3.1., shall not be permitted within a *building*.

## 4.2.4.1.

2) A container of not more than 1 L capacity in the case of Class I liquids and 5 L in the case of Class II or IIIA liquids need not conform to Article 4.2.3.1.

3) It is permitted to use sample containers not conforming to Article 4.2.3.1. for quality control purposes or for testing by regulatory officials.

## 4.2.4. Assembly and Residential Occupancies

### 4.2.4.1. Application

1) This Subsection shall apply to the storage and handling of *flammable liquids* and *combustible liquids* in *buildings* classified as *assembly* or *residential occupancies*, except that it shall not apply to nonresidential schools, universities or colleges covered in Subsection 4.2.6.

### 4.2.4.2. Maximum Quantities

1) Except as provided in Sentence (4) and in Articles 4.2.4.5. and 4.2.4.6., the maximum quantity of *flammable liquid* or *combustible liquid* stored in a *building* shall conform to Sentences (2) and (3).

2) When a single class of liquid is stored in a *building*, the total quantity of liquid shall not exceed

- 30 L of Class I liquids,
- 150 L of Class II liquids, or
- 600 L of Class IIIA liquids.

3) When 2 or more classes of liquid are stored in the same *building*, the total quantity permitted for each class of liquid shall be calculated as follows:

$$\frac{q_I}{30} + \frac{q_{II}}{150} + \frac{q_{IIIA}}{600} \leq 1$$

where

$q_I$  = the actual quantity of Class I liquid present,

$q_{II}$  = the actual quantity of Class II liquid present,

$q_{IIIA}$  = the actual quantity of Class IIIA liquid present.

4) Quantities of *flammable liquids* or *combustible liquids* exceeding those permitted in Sentence (1) are permitted, provided they are kept

- in storage cabinets conforming to Subsection 4.2.10. except that the total quantity of *flammable liquids* and *combustible liquids* stored in such cabinets shall not exceed the quantity permitted for one cabinet, or
- in a storage room conforming to Subsection 4.2.9. and having no openings that communicate directly with the public portions of the *building*.

## 4.2.4.3. Storage Cabinets and Storage Rooms

1) The storage cabinets and storage rooms referred to in Sentence 4.2.4.2.(4) shall not be located above or below the *first storey*.

## 4.2.4.4. Exterior Balconies

1) *Flammable liquids* and *combustible liquids* shall not be stored on exterior balconies.

## 4.2.4.5. Dwelling Units

1) No person shall store Class IA *flammable liquids* in a *dwelling unit*.

2) Subject to Sentence (1), no person shall store more than 15 L of *flammable liquids* and *combustible liquids* in aggregate in a *dwelling unit*.

3) The quantity of *flammable liquid* permitted in Sentence (2) shall not exceed 5 L.  
(See Sentence 4.1.1.1.(3) for oil burning equipment.)

## 4.2.4.6. Attached Garages and Sheds

1) Not more than 50 L of *flammable liquids* and *combustible liquids*, of which not more than 30 L shall be Class I liquids, are permitted to be stored in a garage or shed attached to a *dwelling unit*.

## 4.2.5. Mercantile Occupancies

### 4.2.5.1. Maximum Quantities

1) Except as provided in Sentence (5), the quantities of *flammable liquids* and *combustible liquids* stored in *mercantile occupancies* shall not exceed those in Sentences (2) to (4).

2) In unsprinklered *mercantile occupancies*, the maximum quantity of *flammable liquids* and *combustible liquids* permitted to be stored in a single *suite* shall be the lesser of

- 8 L/m<sup>2</sup> of the total area of the *suite*, provided that not more than 2 L/m<sup>2</sup> is Class I liquid, of which not more than 0.3 L/m<sup>2</sup> shall be Class IA, Class IB, or any combination of these 2 classes, or
- 8 000 L, provided that not more than 2 000 L is Class I liquid, of which not more than 300 L shall be Class IA, Class IB, or any combination of these 2 classes.

3) In *sprinklered mercantile occupancies*, the maximum quantity of *flammable liquids* and *combustible liquids* permitted to be stored in a single *suite* shall be the lesser of

- 24 L/m<sup>2</sup> of the total area of the *suite*, provided that not more than 6 L/m<sup>2</sup> is Class I liquid, of which not more than 1 L/m<sup>2</sup> shall be Class IA, Class IB, or any combination of these 2 classes, or

- b) 24 000 L, provided that not more than 6 000 L is Class I liquid, of which not more than 1 000 L shall be Class IA, Class IB, or any combination of these 2 classes.

4) For the purposes of calculating permissible quantities in Sentences (2) and (3), *mercantile occupancies* of less than 250 m<sup>2</sup> floor area shall be assumed to be 250 m<sup>2</sup> in area.

5) Quantities of *flammable liquids* and *combustible liquids* in excess of those permitted in Sentences (2) to (4), shall be kept in a storage area conforming to Subsection 4.2.7.

#### 4.2.5.2. Containers

1) *Flammable liquids* and *combustible liquids* in *mercantile occupancies* shall be kept in *closed containers*.

2) *Closed containers* of Class I and II liquids shall not be stacked more than 1.5 m high on floors, or 1 m high on individual fixed shelves.

3) Class I liquids in *closed containers* are permitted to be stored in *basements* of *mercantile occupancies*.

#### 4.2.5.3. Transfer

1) In *mercantile occupancies*, transfer of *flammable liquids* or *combustible liquids* into containers shall only be permitted in a storage room conforming to Subsection 4.2.9. (See Appendix A.)

### 4.2.6. Business and Personal Services, Educational and Care or Detention Occupancies

#### 4.2.6.1. Application

1) This Subsection shall apply to the storage, handling and use of *flammable liquids* and *combustible liquids* in *business and personal services occupancies* and *care or detention occupancies* and shall include nonresidential schools, universities and colleges.

#### 4.2.6.2. Storage Cabinets and Storage Rooms

1) Except as permitted in Article 4.2.6.3., *flammable liquids* and *combustible liquids* shall be kept in *closed containers* and stored

- a) in cabinets conforming to Subsection 4.2.10. except that the total quantity of *flammable liquids* and *combustible liquids* stored in such cabinets shall not exceed the quantity permitted for one cabinet, or
- b) in a room having no openings communicating directly with the public

portions of the *building* and conforming to Subsection 4.2.9.

#### 4.2.6.3. Maximum Quantities

1) Except as provided in Sentence (2), the storage of *flammable liquids* and *combustible liquids* outside of a cabinet or room required in Article 4.2.6.2. is permitted, provided such storage does not exceed

- a) 10 L, including not more than 5 L of Class I liquid, in a single room, or
- b) 250 L, including not more than 60 L of Class II liquid, or 10 L of Class I liquid, in a single *fire compartment* having at least a 45 min *fire separation*.

2) In the automotive shops or industrial arts area of an educational facility, storage of up to 75 L of *flammable liquids* and *combustible liquids*, including not more than 25 L of Class I liquid, shall be permitted outside of a cabinet or room as specified in Article 4.2.6.2.

#### 4.2.6.4. Containers

1) Where individual containers with a capacity of more than 5 L are required for storage of *flammable liquids* or *combustible liquids* in a *building*, safety containers conforming to ULC/ORD-C30, "Safety Containers," and of not more than 25 L capacity, shall be used.

#### 4.2.6.5. Separation of Dangerous Goods

1) *Flammable liquids* or *combustible liquids* stored in cabinets or rooms shall be separated from other *dangerous goods* in conformance with Article 4.2.2.3.

### 4.2.7. Industrial Occupancies

#### 4.2.7.1. Application

1) This Subsection applies to the storage of *flammable liquids* and *combustible liquids* in *closed containers* in *industrial occupancies*.

2) Except as provided in Article 1.1.2.3., *buildings* used primarily for the storage of *flammable liquids* or *combustible liquids* shall conform to the appropriate requirements in the Alberta Building Code.

#### 4.2.7.2. Storage Facilities

1) *Flammable liquids* and *combustible liquids* in *industrial occupancies* shall be stored

- a) in storage areas conforming to Article 4.2.7.5.,
- b) in rooms conforming to Subsection 4.2.9.,
- c) in cabinets conforming to Subsection 4.2.10., or
- d) in conformance with Subsection 4.2.8.

## 4.2.7.3.

### 4.2.7.3. Fire Compartments

**1)** *Fire compartments* regulated by this Subsection shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* of at least 2 h.

### 4.2.7.4. Dispensing and Transfer

**1)** Except as permitted in Subsection 4.2.8. and in Sentence (2), the dispensing or transfer of Class I or II liquids shall be conducted in rooms conforming to Subsection 4.2.9.

**2)** It is permitted to dispense or transfer Class I or II liquids in a storage area conforming to Article 4.2.7.5. provided

- a) the storage area does not exceed 100 m<sup>2</sup>, and
- b) the dispensing or transfer operations conform to the applicable requirements of Subsection 4.2.9.

### 4.2.7.5. Maximum Quantities

**1)** Except as provided in Sentence (2), the storage of *flammable liquids* and *combustible liquids* in storage areas specified in Clause 4.2.7.2.(1)(a) shall

- a) conform to Table 4.2.7.5.A.
  - i) where it consists of palletized or solid piled storage, or
  - ii) where stored in *racks* in *buildings* not protected in conformance with Article 4.2.7.7., or
- b) conform to Table 4.2.7.5.B. where stored in *racks* in *buildings* protected in conformance with Article 4.2.7.7.

**2)** Where a *building* is designed for the storage of *flammable liquids* or *combustible liquids*, there is no limit on the total quantity of storage per *fire compartment* provided

- a) the *building* is separated from adjacent *buildings* by

- i) a *firewall* having a *fire-resistance rating* of at least 4 h, or
  - ii) spatial separation in conformance with the Alberta Building Code, and
- b) in protected *rack storage*, the quantities in each *individual storage area* do not exceed those specified in Table 4.2.7.5.B.

(See Appendix A.)

**3)** Where containers for 2 or more liquids having different *flash points* are stored together in a single *individual storage area*, the maximum quantity permitted in the *individual storage area* shall equal that permitted for the liquid with the lowest *flash point*.

**4)** When 2 or more classes of liquids are stored in a single *fire compartment*, the maximum quantity permitted for each class of liquid shall be calculated as follows:

$$\frac{q_{IA}}{Q_{IA}} + \frac{q_{IB}}{Q_{IB}} + \frac{q_{IC}}{Q_{IC}} + \frac{q_{II}}{Q_{II}} + \frac{q_{IIIA}}{Q_{IIIA}} \leq 1$$

where

$q_{IA, IB \text{ or } IC}$  = the actual quantity of Class IA, IB or IC liquid present,

$q_{II}$  = the actual quantity of Class II liquid present,

$q_{IIIA}$  = the actual quantity of Class IIIA liquid present,

$Q_{IA, IB, IC}$  = the maximum quantity of Class IA, IB or IC liquid permitted in Table 4.2.7.5.A. or 4.2.7.5.B. for the arrangement,

$Q_{II}$  = the maximum quantity of Class II liquid permitted in Table 4.2.7.5.A. or 4.2.7.5.B. for the arrangement,

$Q_{IIIA}$  = the maximum quantity of Class IIIA liquid permitted in Table 4.2.7.5.A. or 4.2.7.5.B. for the arrangement.

**Table 4.2.7.5.A.**  
**Indoor Container Storage (Palletized or Solid Piled Storage and Unprotected Rack Storage)**  
 Forming Part of Sentences 4.2.7.5.(1) and (4), 4.2.8.4.(3) and 4.2.9.1.(3)

Class of Liquid	Storage Level	Protected Storage <sup>(1)</sup>			Unprotected Storage		
		Maximum Quantity per I.S.A. <sup>(2)</sup> , L	Maximum Storage Height, m	Maximum Quantity per Fire Compartment, L	Maximum Quantity per I.S.A. <sup>(2)</sup> , L	Maximum Storage Height, m	Maximum Quantity per Fire Compartment, L
Class IA (Flash point below 22.8°C, boiling point below 37.8°C)	First storey	10 000	1.5	50 000	2 500	1.5	2 500
	Storeys above the first storey	7 500	1.5	30 000	2 500	1.5	2 500
	Basement	Not Permitted	Not Permitted	Not Permitted	Not Permitted	Not Permitted	Not Permitted
Class IB (Flash point below 22.8°C, boiling point at or above 37.8°C)	First storey	20 000	2.0	60 000	10 000	1.5	10 000
	Storeys above the first storey	10 000	2.0	50 000	10 000	1.5	10 000
	Basement	Not Permitted	Not Permitted	Not Permitted	Not Permitted	Not Permitted	Not Permitted
Class IC (Flash point at or above 22.8°C and below 37.8°C)	First storey	20 000	2.0	60 000	10 000	1.5	10 000
	Storeys above the first storey	10 000	2.0	50 000	10 000	1.5	10 000
	Basement	Not Permitted	Not Permitted	Not Permitted	Not Permitted	Not Permitted	Not Permitted
Class II (Flash point at or above 37.8°C and below 60°C)	First storey and storeys above the first storey	40 000	3.0	100 000	15 000	3.0	30 000
	Basement	25 000	1.5	25 000	Not Permitted	Not Permitted	Not Permitted
Class IIIA (Flash point at or above 60°C and below 93.3°C)	First storey and storeys above the first storey	60 000	6.0	200 000	50 000	4.5	100 000
	Basement	40 000	3.0	100 000	Not Permitted	Not Permitted	Not Permitted

**Notes to Table 4.2.7.5.A.:**

(1) See Article 4.2.7.7.

(2) Individual storage area

## 4.2.7.6.

**Table 4.2.7.5.B.**  
**Indoor Container Storage (Protected Rack Storage)<sup>(1)</sup>**  
Forming Part of Sentences 4.2.7.5.(1), (2) and (4)

Class of Liquid	Storage Level	Maximum Height, m	Maximum Quantity per Fire Compartment, L
Class IA ( <i>Flash point below 22.8°C, boiling point below 37.8°C</i> )	<i>First storey</i>	7.5	30 000
	<i>Storeys above first storey</i>	4.5	17 000
	<i>Basement</i>	Not Permitted	Not Permitted
Class IB ( <i>Flash point below 22.8°C, boiling point at or above 37.8°C</i> )	<i>First storey</i>	7.5	60 000
	<i>Storeys above first storey</i>	4.5	35 000
	<i>Basement</i>	Not Permitted	Not Permitted
Class IC ( <i>Flash point at or above 22.8°C and below 37.8°C</i> )	<i>First storey</i>	7.5	60 000
	<i>Storeys above first storey</i>	4.5	35 000
	<i>Basement</i>	Not Permitted	Not Permitted
Class II ( <i>Flash point at or above 37.8°C and below 60°C</i> )	<i>First storey</i>	7.5	100 000
	<i>Storeys above first storey</i>	7.5	100 000
	<i>Basement</i>	4.5	35 000
Class IIIA ( <i>Flash point at or above 60°C and below 93.3°C</i> )	<i>First storey</i>	12.0	200 000
	<i>Storeys above first storey</i>	6.0	200 000
	<i>Basement</i>	6.0	100 000

### Notes to Table 4.2.7.5.B.:

(1) See Article 4.2.7.7.

## 4.2.7.6. Spill Control

**1)** Measures to control spilled *flammable liquids* and *combustible liquids* shall be provided in conformance with Subsection 4.1.6.

## 4.2.7.7. Fire Suppression Systems

**1)** Where protection is required by Article 4.2.7.5., storage areas for containers of *flammable liquids* and *combustible liquids* shall be protected by an automatic sprinkler system in conformance with Article 6.5.1.1. or an equivalent fixed fire suppression system. (See Appendix A.)

## 4.2.7.8. Clearances

**1)** The clearance between the top of storage and the lowest structural members, sprinkler head deflectors or other overhead fire protection system components shall be not less than 450 mm.

**2)** A clearance of not less than 400 mm shall be maintained between stored *flammable liquids* and *combustible liquids* and walls, except that where the width of storage adjacent to the wall is not more than 1.5 m, such wall clearance is not required. (See Appendix A.)

## 4.2.7.9. Aisles

**1)** Except as provided in Article 4.2.7.10., main aisles, access aisles and aisles defining

*individual storage areas*, shall be in conformance with Article 3.2.2.2.

## 4.2.7.10. Separation from Other Dangerous Goods

**1)** *Flammable liquids* and *combustible liquids* shall not be stored with other *dangerous goods* unless in conformance with Article 4.2.2.3.

## 4.2.7.11. Separation from Combustible Products

**1)** Combustibles other than those used for the packaging of the *flammable liquids* or *combustible liquids* shall not be stored in the same *individual storage area* with such liquids.

## 4.2.7.12. Absorbents

**1)** Absorbent materials shall be available in the storage area for use in clean-up of spilled *flammable liquids* or *combustible liquids* in conformance with Article 4.1.6.3.

## 4.2.7.13. Ventilation

**1)** Storage areas described in Article 4.2.7.1. shall be ventilated in conformance with Subsection 4.1.7.

## 4.2.8. Incidental Use

### 4.2.8.1. Application

1) Except as otherwise noted in this Part, this Subsection applies to *industrial occupancies* where the use, storage and handling of *flammable liquids* or *combustible liquids* is secondary to the principal activity. (See Appendix A.)

### 4.2.8.2. Maximum Quantities

1) Except as provided in Sentences (2) and (3) and in Article 4.2.8.4., the quantity of *flammable liquids* and *combustible liquids* permitted to be located outside of storage rooms conforming to Subsection 4.2.7., 4.2.9. or 4.3.13., or storage cabinets conforming to Subsection 4.2.10., in any one *fire compartment* of a *building*, shall not be more than

- a) 600 L of *flammable liquids* and *combustible liquids* in *closed containers*, of which not more than 100 L shall be Class IA liquids, and
- b) 5 000 L of Class IB, IC, II and IIIA liquids in *storage tanks* or portable tanks.

2) Where required for normal plant activity, quantities of *flammable liquids* and *combustible liquids* are permitted to exceed those specified in Sentence (1), but shall not be greater than the supply for one day of normal operation.

3) Where larger quantities than are permitted by Sentence (2) are required, such quantities shall be in *storage tanks* installed in conformance with Sentence 4.3.12.4.(2).

### 4.2.8.3. Handling

1) Areas in which *flammable liquids* or *combustible liquids* are transferred from one container or *storage tank* to another, or are used in such a way as to release potentially explosive concentrations of flammable vapours, shall be

- a) separated from possible sources of ignition by a spatial separation of not less than 6 m, or by a *fire separation* (see A-4.1.5.3.(1) and A-4.2.8.3.(1)(a) in Appendix A),
- b) provided with a drainage system to control spills in conformance with Subsection 4.1.6.,
- c) provided with absorbent materials to assist in clean-up of small liquid spills in conformance with Article 4.1.6.3.,
- d) provided with either natural or mechanical ventilation in conformance with Subsection 4.1.7., and
- e) separated from other *dangerous goods* in conformance with Article 4.2.2.3.

### 4.2.8.4. General Storage Areas

1) In a general storage area covered in Subsection 3.2.3., quantities of *flammable liquids* and *combustible liquids* are permitted to exceed those in Sentence 4.2.8.2.(1) provided the storage area is in conformance with Sentences (2) to (6).

2) The storage area referred to in Sentence (1) shall be *sprinklered* in conformance with Article 3.2.3.3., providing a level of protection not less than that required for Class IV commodities stored up to a height of 6 m.

3) The height of storage of *flammable liquids* and *combustible liquids* shall be not more than those permitted for unprotected storage in Table 4.2.7.5.A.

4) When a single class of liquid is stored, the total quantity in a single *fire compartment* shall be not more than

- a) 2 500 L of Class IB and IC liquid,
- b) 5 000 L of Class II liquid, or
- c) 10 000 L of Class IIIA liquid.

5) When 2 or more classes of liquid are stored in the same *fire compartment*, the total quantity permitted for each class of liquid shall be calculated as follows:

$$\frac{q_I}{2\,500} + \frac{q_{II}}{5\,000} + \frac{q_{IIIA}}{10\,000} \leq 1$$

where

$q_I$  = the actual quantity of Class IB and IC liquid present,

$q_{II}$  = the actual quantity of Class II liquid present,

$q_{IIIA}$  = the actual quantity of Class IIIA liquid present.

6) When 2 or more classes of liquid are stored in the same *individual storage area*, the maximum quantity permitted in the *individual storage area* shall be that permitted for the liquid with the lowest limit listed in Sentence (4).

## 4.2.9. Rooms for Container Storage and Dispensing

### 4.2.9.1. Maximum Quantities

1) Except as provided in Sentences (2) and (3), where *flammable liquids* and *combustible liquids* are stored in a room required in this Part, the storage densities averaged over the total room area and the total quantities of such liquids shall conform to Table 4.2.9.1.

2) The maximum quantities and densities of *flammable liquids* and *combustible liquids* shown in Table 4.2.9.1. are permitted to be doubled provided the storage room is protected by an automatic fire suppression system conforming to Article 4.2.7.7.

## 4.2.9.2.

Table 4.2.9.1.  
Rooms for Container Storage and Dispensing  
Forming Part of Sentences 4.2.9.1.(1) and (2)

Maximum Quantity, L	Minimum Fire Separation Around Room, h	Maximum Density, L/m <sup>2</sup>
10 000	2	200
1 500	1	100

- 3) The maximum quantities of Class I liquids in an unprotected storage room with a *fire separation* having a *fire-resistance rating* of not less than 2 h shall
- not exceed those specified for unprotected storage in Table 4.2.7.5.A., and
  - comply with Sentences 4.2.7.5.(3) and (4).

### 4.2.9.2. Spill Control

1) Storage rooms referred to in Article 4.2.9.1. shall be liquid-tight where the walls join the floor.

2) Storage rooms referred to in Sentence (1) shall be designed to accommodate possible spills of *flammable liquids* and *combustible liquids* in conformance with Subsection 4.1.6.

### 4.2.9.3. Ventilation

1) Storage rooms referred to in Article 4.2.9.1. shall be ventilated in conformance with Subsection 4.1.7.

### 4.2.9.4. Aisles

1) The contents of *flammable liquid* and *combustible liquid* storage rooms referred to in Article 4.2.9.1. shall be arranged to provide aisle widths of not less than 1 m.

### 4.2.9.5. Dispensing

1) Dispensing of *flammable liquids* or *combustible liquids* from containers having a capacity of more than 30 L shall be by pumps or through self-closing valves, designed in conformance with good engineering practice. (See A-4.1.8.3.(1) in Appendix A.)

### 4.2.9.6. Explosion Venting

1) Where Class IA or IB liquids are dispensed within a storage room, the room shall be designed to prevent critical structural and mechanical damage from an internal explosion in conformance with good engineering practice such as described in NFPA 68, "Venting of Deflagrations." (See A-3.2.8.2.(1)(d) in Appendix A.)

### 4.2.9.7. Portable Extinguishers

1) Portable extinguishers shall be provided for storage rooms described in Article 4.2.9.1. in conformance with Part 6.

## 4.2.10. Cabinets for Container Storage

### 4.2.10.1. Containers

1) *Flammable liquids* and *combustible liquids* stored in cabinets required in this Part shall be in *closed containers* conforming to Article 4.2.3.1.

### 4.2.10.2. Maximum Quantity per Cabinet

1) The maximum quantity of *flammable liquids* and *combustible liquids* stored in a cabinet shall be 500 L, of which not more than 250 L shall be Class I liquids.

### 4.2.10.3. Maximum Quantity per Fire Compartment

1) Except as provided in Sentences (2) and (3), the total quantity of *flammable liquids* and *combustible liquids* stored in cabinets in a single *fire compartment* shall not exceed the quantity permitted in Article 4.2.10.2. for 3 cabinets.

2) In *industrial occupancies*, quantities of *flammable liquids* and *combustible liquids* greater than those specified in Sentence (1) are permitted in a single *fire compartment* if

- the total quantity stored in a group of cabinets is not more than the quantity permitted for 3 cabinets, and
- the distance between groups of cabinets described in Clause (a) is not less than 30 m.

3) In *care or detention occupancies*, the total quantity of *flammable liquids* and *combustible liquids* stored in cabinets in a single *fire compartment* shall not exceed the quantity permitted for one cabinet.

### 4.2.10.4. Labelling

1) Cabinets for container storage shall be labelled in conspicuous lettering to indicate that the cabinet contains flammable materials and that open flames must be kept away.

### 4.2.10.5. Fire Endurance

1) Storage cabinets required in this Part shall conform to ULC-C1275, "Storage Cabinets for Flammable Liquid Containers."

### 4.2.10.6. Ventilation

1) When a storage cabinet required in this Part is provided with ventilation openings,

- a) the ventilation openings shall be sealed with materials providing a fire protection at least equivalent to that required for the construction of the cabinet, or
- b) the cabinet shall be vented outdoors using vent piping providing a fire protection at least equivalent to that required in Clause (a) for seals.

## 4.2.11. Outdoor Container Storage

### 4.2.11.1. Quantities and Clearances

1) Except as provided in Sentence (2), the quantities and clearances for *flammable liquids* and *combustible liquids* stored in containers in outdoor storage areas shall conform to Table 4.2.11.1.

2) The clearances required in Sentence (1) do not apply where not more than 5 000 L of *flammable liquids* or *combustible liquids* are stored adjacent to a *building* on the same property, provided that either

- a) the *building* is limited to 1 *storey* in *building* height and is used primarily for the storage or handling of *flammable liquids* or *combustible liquids*, or
- b) the exposed wall has a *fire-resistance rating* of at least 2 h and has no openings within 3 m of such outdoor storage.

### 4.2.11.2. Mixed Storage

1) Where 2 or more liquids with different *flash points* are stored outdoors in containers that form a single pile, the maximum total quantity permitted in the pile shall be equal to that permitted for the liquid with the lowest *flash point*.

### 4.2.11.3. Fire Department Access

1) An access route not less than 6 m wide constructed in conformance with Subsection 3.2.5. of the Alberta Building Code shall be provided in outdoor storage areas to permit the approach of fire department vehicles to within 60 m of any part of a pile.

### 4.2.11.4. Spill Control

1) Outdoor storage areas for *flammable liquids* or *combustible liquids* shall be designed to accommodate possible spillage in conformance with Subsection 4.1.6.

### 4.2.11.5. Fencing

1) An outdoor area used for the container storage of *flammable liquids* or *combustible liquids* shall be fenced in conformance with Article 3.3.2.6.

Table 4.2.11.1.  
Outdoor Container Storage  
Forming Part of Sentence 4.2.11.1.(1)

Class of Liquid	Maximum Total Quantity, per Pile, L	Minimum Distance between Piles, m	Minimum Distance to a Property Line or to a <i>Building</i> on the Same Property, m
Class IA	5 000	1.5	6
Class IB or IC	15 000	1.5	6
Class II	35 000	1.5	6
Class IIIA	85 000	1.5	6

## Section 4.3. Tank Storage

### 4.3.1. Design, Construction and Use of Storage Tanks

#### 4.3.1.1. Application

1) This Section applies to *storage tanks* for *flammable liquids* and *combustible liquids*.

#### 4.3.1.2. Atmospheric Storage Tanks

1) Except as permitted in Sentence (3) and in Section 4.9., *atmospheric storage tanks* shall be built in conformance with the following:

- a) API 650, "Welded Steel Tanks for Oil Storage,"
- b) ULC-S601, "Shop Fabricated Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids,"
- c) CAN/ULC-S602-M, "Aboveground Steel Tanks for Fuel Oil and Lubricating Oil,"
- d) CAN/ULC-S603, "Steel Underground Tanks for Flammable and Combustible Liquids,"
- e) CAN/ULC-S603.1, "Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids,"
- f) CAN4-S615-M, "Reinforced Plastic Underground Tanks for Petroleum Products,"
- g) ULC-S630, "Shop Fabricated Steel Aboveground Vertical Tanks for Flammable and Combustible Liquids,"
- h) CAN/ULC-S643-M, "Shop Fabricated Steel Aboveground Utility Tanks for Flammable and Combustible Liquids,"
- i) ULC-S652, "Tank Assemblies for Collection of Used Oil,"
- j) ULC-S653, "Aboveground Steel Contained Tank Assemblies for Flammable and Combustible Liquids,"
- k) ULC/ORD-C58.10, "Jacketed Steel Underground Tanks for Flammable and Combustible Liquids,"
- l) ULC/ORD-C142.5, "Concrete Encased Steel Aboveground Tank Assemblies for Flammable and Combustible Liquids,"
- m) ULC/ORD-C142.16, "Protected Aboveground Tank Assemblies for Flammable and Combustible Liquids,"
- n) ULC/ORD-C142.18, "Rectangular Steel Aboveground Tanks for Flammable and Combustible Liquids,"
- o) ULC/ORD-C142.22, "Contained Steel Vertical Aboveground Tank Assemblies for Flammable and Combustible Liquids," or

p) ULC/ORD-C142.23, "Aboveground Waste Oil Tanks."

2) When necessitated by possible contamination of the liquid to be stored or possible rapid corrosion of the tank, *storage tanks* need not conform to Sentence (1), provided that they are designed and built in conformance with good engineering practice for the material being used.

3) *Atmospheric storage tanks* shall not be used for the storage of *flammable liquids* or *combustible liquids* at temperatures at or above their boiling points.

#### 4.3.1.3. Low Pressure Storage Tanks and Pressure Vessels

1) *Low pressure storage tanks* shall be constructed in conformance with

- a) API 620, "Design and Construction of Large, Welded, Low-Pressure Storage Tanks," or
- b) boiler and pressure vessel regulations made pursuant to the Safety Codes Act.

2) *Pressure vessels* shall be constructed in conformance with boiler and pressure vessel regulations made pursuant to the Safety Codes Act.

3) *Low pressure storage tanks* and *pressure vessels* are permitted to be used as *atmospheric storage tanks*.

#### 4.3.1.4. Operating Pressure

1) The normal operating pressure of a *storage tank* shall not exceed its design pressure.

#### 4.3.1.5. Corrosion Protection

1) The exposed surface of every aboveground *storage tank* for *flammable liquids* or *combustible liquids* which is fabricated of any ferrous substance shall be thoroughly coated with rust-resisting material compatible with the tank.

#### 4.3.1.6. Floating Roofs

1) Except for perimeter sealing material, floating roof assemblies or internal floating covers installed in *storage tanks* shall be constructed of metal, or other materials and design conforming to one of the tank construction standards listed in this Subsection.

#### 4.3.1.7. Identification

1) Except as required by Sentences (2) and (3), a *storage tank* and its filling and emptying connections shall be identified in conformance with CPPI, "Using the CPPI Colour-Symbol System to Mark Equipment and Vehicles for Product Identification."

**2)** The contents of every aboveground *storage tank* shall be clearly identified by signs with letters of sufficient size to ensure legibility from not less than 4.5 m or from outside a diked area, whichever is greater.

**3)** Signs installed in accordance with Sentence (2) shall be located on at least two sides of a *storage tank*.

#### 4.3.1.8. Overfill Protection

**1)** Except as required in Subsections 4.3.8. and 4.3.17., a *storage tank* shall be prevented from being overfilled by providing

- a) continuous supervision of the filling operations by personnel qualified to supervise such operations, or
- b) an overfill protection device conforming to ULC/ORD-C58.15, "Overfill Protection Devices for Flammable Liquid Storage Tanks" (see Appendix A).

### 4.3.2. Installation of Outside Aboveground Storage Tanks

#### 4.3.2.1. Location

**1)** Every outside aboveground *storage tank* for the storage of *flammable liquids* or *combustible liquids* shall be located in conformance with Sentences (2) to (5) with respect to a property line or a *building* on the same property.

**2)** Except as provided in Sentences (6) and (7), every aboveground *storage tank* containing stable liquids and having a working pressure of not more than 17 kPa (gauge) shall be separated from a property line or a *building* on the same property by distances

- a) half those in Table 4.3.2.1. where protection is provided against fire or explosion in the tank in conformance with Sentence 4.3.2.5.(2), or
- b) equal to those in Table 4.3.2.1. where protection referred to in Clause (a) is not provided.

**3)** Every aboveground *storage tank* containing *unstable liquids* and having a working pressure of not more than 17 kPa (gauge) shall be separated from a property line or a *building* on the same property by distances

- a) equal to those in Table 4.3.2.1., but not less than 7.5 m, where protection is provided against fire or explosion in the tank in conformance with Sentence 4.3.2.5.(2), or
- b) 3 times those in Table 4.3.2.1., but not less than 15 m, where protection referred to in Clause (a) is not provided.

**4)** Every aboveground *storage tank* containing boil-over liquids shall be separated from

a property line or a *building* on the same property by distances

- a) 0.75 times those in Table 4.3.2.1. where protection is provided against fire or explosion in the tank in conformance with Sentence 4.3.2.5.(2), or
- b) equal to those in Table 4.3.2.1. where protection referred to in Clause (a) is not provided.

(See Appendix A.)

**Table 4.3.2.1.**  
**Location of Aboveground Storage Tanks**  
Forming Part of Sentences 4.3.2.1.(2), (3) and (4), and 4.8.2.1.(2) and (3)

Maximum Tank Capacity, L	Minimum Distance to a Property Line or to a <i>Building</i> on the Same Property, m
250 000	3
500 000	4.5
2 500 000	9
5 000 000	12
over 5 000 000	15

**5)** Where a *storage tank* containing stable liquids or *unstable liquids* has a working pressure greater than 17 kPa (gauge), the distances from a property line or a *building* on the same property shall be those specified in Sentences (2) and (3) multiplied by 1.5, but shall be not less than 7.5 m.

**6)** The minimum distance required in Sentence (2) from a *storage tank* containing only Class II or IIIA liquids to a *building* on the same property is permitted to be reduced to

- a) 1.5 m provided the tank capacity is not more than 50 000 L,
- b) 0.5 m provided the tank capacity is not more than 5 000 L, or
- c) zero provided the tank capacity is not more than 2 500 L.

**7)** The minimum distance required in Sentence (2) is permitted to be waived provided the *storage tank*

- a) is in conformance with ULC/ORD-C142.16, "Protected Aboveground Tank Assemblies for Flammable and Combustible Liquids," and
- b) has a capacity of not more than 50 000 L.

**8)** Where end failure of horizontal *storage tanks* may endanger adjacent property, the tanks shall be placed with the longitudinal axis parallel to such property.

## 4.3.2.2.

### 4.3.2.2. Spacing between Storage Tanks

1) Except as required in Sentences (2) and (3) and in Article 4.3.2.3., the minimum distance between every combination of 2 aboveground *storage tanks* shall be 0.25 times the sum of their diameters, but shall be not less than 1 m.

2) The minimum distance between any 2 *storage tanks*, neither of which has a capacity of more than 250 000 L, shall be 1 m.

3) Where either of 2 aboveground *storage tanks* contains *unstable liquids*, the distance required in Sentences (1) and (2) shall be doubled.

### 4.3.2.3. Clearances from Liquefied Petroleum Gas Cylinders and Tanks

1) The minimum separation between a *flammable liquid* or *combustible liquid storage tank* and a liquefied petroleum gas cylinder or tank shall be 6 m.

2) Secondary containments for *flammable liquid* and *combustible liquid storage tanks* shall not contain any liquefied petroleum gas cylinder or tank, and the centre line of the secondary containment wall shall be not less than

- a) 3 m away from a liquefied petroleum gas cylinder, and
- b) 6 m away from a liquefied petroleum gas tank.

### 4.3.2.4. Fire Department Access

1) Except as provided in Sentences (2) and (3), *storage tanks* for *flammable liquids* or *combustible liquids* shall be spaced so that each *storage tank* is accessible for fire fighting purposes.

2) An access route constructed in conformance with Subsection 3.2.5. of the Alberta Building Code shall be provided in outdoor storage areas to permit the approach of fire department vehicles to within 60 m travelling distance of any *storage tank*.

3) Where fire fighting access to *storage tanks* containing Class I or II liquids is not provided, fire extinguishing measures conforming to Sentence 4.3.2.5.(2) shall be provided.

### 4.3.2.5. Fire Protection Systems

(See Appendix A.)

1) Where the diameter of a *storage tank* exceeds 45 m, the *storage tank* shall be provided with protection against fires or explosions in conformance with Sentence (2).

2) Protection against fires or explosions required for a *storage tank* shall consist of fixed protection systems designed in conformance with good engineering practice such as described in

- a) NFPA 11, "Low Expansion Foam and Combined Agent Systems,"
- b) NFPA 15, "Water Spray Fixed Systems for Fire Protection," and
- c) NFPA 69, "Explosion Prevention Systems."

### 4.3.2.6. Leakage Testing

1) At the time of installation, aboveground *storage tanks* and associated piping shall be tested for leakage in conformance with Subsections 4.3.15. and 4.4.6.

## 4.3.3. Supports, Foundations and Anchorage for Aboveground Storage Tanks

### 4.3.3.1. Foundations and Supports

1) *Storage tanks* shall rest on the ground or on foundations, supports or piling made of concrete, masonry or steel in conformance with

- a) Appendix B of API 650, "Welded Steel Tanks for Oil Storage," and
- b) Appendices C and D of API 620, "Design and Construction of Large, Welded, Low-Pressure Storage Tanks."

2) Tank supports shall be installed on firm foundations designed to minimize uneven settling of the tank and to minimize corrosion of the part of the tank resting on the foundation.

3) Except for steel saddles that are less than 300 mm high at their highest point, supports for *storage tanks* shall provide a *fire-resistance rating* of not less than 2 h.

4) Every aboveground *storage tank* shall be supported in a manner that will prevent the allowable design stress of the tank from being exceeded.

### 4.3.3.2. Earthquake Protection

1) In areas subject to earthquake forces, *storage tanks*, supports and connections shall be designed to resist such forces in conformance with

- a) Part 4 of the Alberta Building Code, and
- b) Appendix A of ULC-S630, "Shop Fabricated Steel Aboveground Vertical Tanks for Flammable and Combustible Liquids."

### 4.3.3.3. Protection against Flooding

1) When aboveground *storage tanks* are located in an area that may be subjected to flooding, the tanks shall be securely anchored to prevent floating.

#### 4.3.3.4. Protection against Mechanical Damage

1) The *authority having jurisdiction* may require that an aboveground *storage tank* be provided with barriers, if there is potential for mechanical damage to the *storage tank* from vehicles or other sources.

#### 4.3.4. Normal and Emergency Venting for Aboveground Storage Tanks

##### 4.3.4.1. Design and Installation

1) *Atmospheric and low pressure storage tanks* shall be provided with normal and emergency venting in conformance with

- a) API 2000, "Venting Atmospheric and Low-Pressure Storage Tanks," or
- b) the tank design standards listed in Sentence 4.3.1.2.(1).

##### 4.3.4.2. Unstable Liquids

1) When *unstable liquids* are stored, the effects of heat or gas resulting from polymerization, decomposition, condensation or self-reactivity shall be allowed for in the determination of the total venting capacity.

#### 4.3.5. Vent Piping for Aboveground Storage Tanks

##### 4.3.5.1. Materials and Construction

1) Vent piping materials and construction shall conform to Section 4.4.

##### 4.3.5.2. Location of Vent Pipe Outlets

- 1) Vent pipe outlets for *storage tanks* of Class I liquids
- a) shall be located outside *buildings* not less than
    - i) 3.5 m above the adjacent ground level, and
    - ii) 1.5 m from any *building* opening, and
  - b) shall discharge so that flammable vapours will not enter the *building* or be trapped near any part of the *building*.
- 2) Vent pipe outlets for Class II or IIIA liquids shall discharge outside *buildings* not less than
- a) 2 m above the adjacent ground level, and
  - b) 1.5 m from any *building* opening.

##### 4.3.5.3. Interconnection of Vent Piping

1) Except as provided in Sentence (2), 2 or more *storage tanks* are permitted to be connected to a common vent pipe for normal relief venting

provided the vent pipe size is designed to vent the combined vapours produced in the connected tanks without exceeding the allowable stresses of the tanks.

2) Vent piping for *storage tanks* for Class I liquids shall not be connected to vent piping for *storage tanks* for Class II or IIIA liquids unless an effective arrangement is provided to prevent the vapours from the Class I liquids from entering the other tanks.

#### 4.3.6. Openings Other than Vents in Aboveground Storage Tanks

##### 4.3.6.1. Provision of Valves

1) Connections to aboveground *storage tanks* at any level below the highest level to which the liquid will rise shall be provided with valves located as close as practicable to the shell.

##### 4.3.6.2. Materials

1) Valves and their connections to a *storage tank* shall be made of steel, except that when the chemical characteristics of the liquid stored are incompatible with steel, materials other than steel are permitted to be used.

2) Materials for valves and their connections to a *storage tank* shall be suitable for the pressures, stresses and temperatures that may be expected, including those of possible fire exposure.

##### 4.3.6.3. Openings for Liquid Level Measurements

1) Openings for measuring liquid levels in *storage tanks* for Class I liquids shall be equipped with caps or covers which shall be opened only when measuring the liquid level.

##### 4.3.6.4. Connections for Filling and Emptying

1) Except as provided in Sentence (3), connections used as part of normal operating conditions for filling or emptying *storage tanks* for *flammable liquids* and *combustible liquids* shall be located

- a) outside *buildings*,
- b) at a location free of sources of ignition,
- c) not less than 1.5 m away from *building* openings, and
- d) identified in conformance with Sentence 4.3.1.7.(1).

2) Connections for filling or emptying *storage tanks* shall be kept closed to prevent leakage when not in use.

### 4.3.7.1.

- 3)** A filling connection described in Sentence (1) is permitted to be located inside a *building* if
- this is made necessary
    - by a process or activity located indoors and to which the tank is directly associated, or
    - for the collection of used liquids, and
  - the fill piping is provided with means to prevent flammable vapours from returning to the *building*.

### 4.3.7. Secondary Containment for Aboveground Storage Tanks

#### 4.3.7.1. General

- 1)** The area surrounding a *storage tank* or group of *storage tanks* shall be designed to accommodate accidental spillage in conformance with Subsection 4.1.6.
- 2)** Where barriers described in Sentence 4.1.6.1.(1) are provided to contain accidental spillage from aboveground *storage tanks*, they shall conform to the requirements for secondary containment in this Subsection.
- 3)** A *storage tank* conforming to Sentence 4.3.7.4.(2) shall be considered as conforming to this Subsection provided it is used and maintained in conformance with Articles 4.3.7.8. and 4.3.7.9.

#### 4.3.7.2. Construction

- 1)** Except as provided in Sentence (2), the base and walls of a secondary containment shall be made of noncombustible materials, and shall be designed, constructed and maintained to
- withstand full hydrostatic head, and
  - provide a permeability of not more than  $10^{-6}$  cm/s to the *flammable liquids* or *combustible liquids* contained in the *storage tanks*.
- 2)** Where a membrane provides the level of impermeability required in Sentence (1), it shall
- conform to ULC/ORD-C58.9, "Secondary Containment Liners for Underground and Aboveground Flammable and Combustible Liquid Tanks," and
  - when the membrane is combustible, be covered with a noncombustible material of such nature and thickness that the membrane will not fail when the secondary containment is exposed to fire.
- 3)** Except as provided in Sentence (4), openings shall not be permitted in a secondary containment.

- 4)** Where piping passes through a secondary containment, such passages shall conform to Sentences (1) and (2).

#### 4.3.7.3. Capacity

(See A-4.1.6.1.(1) in Appendix A.)

- 1)** Except as permitted in Sentence (3), a secondary containment for a single *storage tank* shall have a volumetric capacity of not less than 110% of the capacity of the tank.
- 2)** Except as permitted in Sentence (3), a secondary containment for more than one *storage tank* shall have a volumetric capacity of not less than the sum of
- the capacity of the largest *storage tank* located in the contained space, and
  - 10% of the greater of
    - the capacity specified in Clause (a), or
    - the aggregate capacity of all other *storage tanks* located in the contained space.
- 3)** When the secondary containment is designed to prevent the entry of precipitation and water used for fire fighting purposes into the contained space, it shall have a volumetric capacity of not less than the capacity of the largest *storage tank* located in the contained space.

#### 4.3.7.4. Clearances

(See Appendix A.)

- 1)** Except as provided in Sentence (2), no part of a secondary containment wall shall be less than 1.5 m from a *storage tank* shell.
- 2)** It is permitted to waive the distance required in Sentence (1) provided the *storage tank*
- is constructed in accordance with Clauses 4.3.1.2.(1)(j), (l), (m) and (o), incorporating secondary containment,
  - has a capacity of not more than 50 000 L, and
  - is protected by posts or guardrails when exposed to collision damage.

#### 4.3.7.5. Access to Storage Tanks and Ancillary Equipment

- 1)** A secondary containment shall permit
- access to *storage tanks*, valves and ancillary equipment,
  - egress from the contained space, and
  - access for fire fighting as specified in Article 4.3.2.4.
- (See Appendix A.)
- 2)** Where a *storage tank* contains Class I liquids, provisions shall be made for the normal operation of valves and for access to the *storage tank*

roof without entering the contained space created by the secondary containment when

- a) the average height of the secondary containment exceeds 3.5 m, measured from the ground level of the interior of the contained area, or
- b) the distance between the tank shell and the top inside edge of the secondary containment wall is less than the height of this wall.

(See Appendix A.)

#### 4.3.7.6. Emergency Venting

1) Where the secondary containment is not open to the atmosphere, emergency venting shall be provided to relieve any buildup of internal pressure in the contained space when exposed to heat or fire.

#### 4.3.7.7. Leak Detection

1) Where the contained space created by the secondary containment is not accessible for visual examination, a monitoring device shall be provided to indicate the presence of liquid in, or the loss of integrity of the secondary containment.

#### 4.3.7.8. Drainage

1) Liquids, debris and precipitation shall not accumulate in the contained space created by the secondary containment.

2) Provisions shall be made for removing liquid from the secondary containment in conformance with Subsection 4.1.6.

3) Controls for the liquid removal system required in Sentence (2) shall be

- a) normally closed,
- b) accessible under fire exposure conditions, and
- c) located so they can be operated from outside the contained space.

4) Centrifugal type pumps shall not be used to transfer water contaminated with *flammable liquids* or *combustible liquids* from diked areas to a collection system.

#### 4.3.7.9. Use of Secondary Containment

1) The contained space created by a secondary containment shall not be used for storage purposes.

### 4.3.8. Installation of Underground Storage Tanks

#### 4.3.8.1. Location

1) Underground *storage tanks* shall be located so that

- a) foundations of existing *buildings* will not be undermined during excavation, and

- b) loads from *building* foundations and supports are not transmitted to the tank.

2) Underground *storage tanks* shall be located not less than

- a) 600 mm from adjacent tanks,
- b) 1 m from a *building* or *street* line, and
- c) 1.5 m from other property lines.

3) The location of each proposed *underground storage tank system* shall be assigned a site sensitivity classification in accordance with Sentences (4) and (5) by the *authority having jurisdiction*.

4) The site sensitivity classification shall be Class A where the *underground storage tank system* is located within

- a) 500 m of wells or other locations where underground water is being used,
- b) 200 m of a lake, river or other body of water,
- c) 150 m of a major underground structure, or
- d) a municipality that has been deemed to require protection from hydrocarbon spills.

5) The site sensitivity classification shall be Class B if it does not meet the criteria for Class A sites described in Sentence (4).

6) No person shall install an *underground storage tank system* at a location that has a site sensitivity classification of Class A as described in Sentence (4), unless

- a) the *underground storage tank system* is constructed and installed in conformance with this Part,
- b) a means of *secondary containment* is provided (see Appendix A),
- c) an *overflow protection device* conforming to ULC/ORD-C58.15, "Overflow Protection Devices for Flammable Liquid Storage Tanks," is installed,
- d) a *spill containment device* conforming to ULC/ORD-C58.19, "Spill Containment Devices for Underground Flammable Liquid Storage Tanks," is installed,
- e) leak detection is installed (see Appendix A),
- f) a line leak detection device is installed on pressurized or suction piping systems (see Appendix A),
- g) all *storage tank* fill pipes are equipped with liquid and vapour tight adapters and caps,
- h) a valve is installed on buried suction piping systems in order to isolate piping during leakage testing, and
- i) under dispenser sumps conforming to ULC/ORD-C107.21, "Under Dispenser Sumps," are installed.

## 4.3.8.2.

- 7) No person shall install an *underground storage tank system* at a location that has a site sensitivity classification of Class B as described in Sentence (5) unless
- a) the *underground storage tank system* is constructed and installed in conformance with this Part,
  - b) an *overflow protection device* conforming to Clause 4.3.8.1.(6)(c) is installed,
  - c) a *spill containment device* conforming to Clause 4.3.8.1.(6)(d) is installed,
  - d) leak detection is installed (see A-4.3.8.1.(6)(e) in Appendix A),
  - e) a line leak detection device is installed on pressurized or suction piping systems (See A-4.3.8.1.(6)(f) in Appendix A),
  - f) all *storage tank* fill pipes are equipped with liquid and vapour tight adapters and caps,
  - g) a valve is installed on buried suction piping systems in order to isolate piping during leakage testing, and
  - h) under dispenser sumps conforming to ULC/ORD-C107.21, "Under Dispenser Sumps," are installed.

### 4.3.8.2. Ground Cover

1) Except as required in Sentences (2) to (4), *underground storage tanks* shall be installed with not less than 600 mm of ground cover over the tank.

2) Except as required in Sentence (3), *storage tanks* subjected to vehicular traffic shall be installed not less than 1 m below finished ground level.

3) Either a 150 mm reinforced concrete slab or a 200 mm unreinforced concrete slab over not less than 450 mm of sand is permitted in lieu of the protection described in Sentence (2) provided the slab extends at least 300 mm beyond the *storage tank*.

4) Where subsurface conditions make it impracticable to install a *storage tank* totally below adjacent ground level, an *underground storage tank* shall be installed so that at least

- a) 75% of its mass is below adjacent ground level provided there is not less than 600 mm of ground cover over the portion of the tank above adjacent ground level, or
- b) 50% of its mass is below adjacent ground level provided there is not less than 1 m of ground cover over the portion of the tank above adjacent ground level.

### 4.3.8.3. Damage Repair

1) *Underground storage tanks* in the process of being installed shall be inspected, and any damage to the protective coating or anodes shall be repaired before they are lowered into the excavation.

2) An *underground storage tank* that is damaged shall not be repaired on site and used for storage unless

- a) the repair is done by the manufacturer in accordance with ULC refurbishing specifications, and
- b) the manufacturer certifies in writing that the repaired tank meets the applicable manufacturing codes.

(See Appendix A.)

### 4.3.8.4. Damage Prevention

1) *Underground storage tanks* shall be lowered into the excavation by the use of lifting lugs and hooks and, where necessary, spreader bars to prevent damage to the protective coating.

2) Any method of handling that might result in damage to the protective coating of the tank shall not be used.

### 4.3.8.5. Installation

1) *Underground steel storage tanks* shall be installed in conformance with Appendix B of CAN/ULC-S603.1, "Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids."

2) *Underground reinforced plastic storage tanks* shall be installed in conformance with Appendix A of CAN4-S615-M, "Reinforced Plastic Underground Tanks for Petroleum Products."

3) *Underground storage tanks* shall not be placed in direct contact with reinforced concrete slabs but shall be separated by not less than 150 mm of sand or other suitable material to distribute evenly the weight of the tank on the supporting base.

### 4.3.8.6. Leakage Testing

1) At the time of installation, *underground storage tanks* and associated piping shall be tested for leakage in conformance with Subsections 4.3.15. and 4.4.6.

### 4.3.8.7. Filling

1) *Flammable liquids or combustible liquids* shall not be placed in an *underground storage tank* until

- a) the fill pipe and vent line have been installed in the tank, and
- b) all other openings have been sealed.

### 4.3.8.8. Spillage

1) If a spillage occurs, the escaped liquid and all soil contaminated by the spill shall be removed in conformance with Subsection 4.1.6.

**4.3.8.9. Anchorage**

**1)** Where a high water table is anticipated, underground *storage tanks* shall be protected against uplift due to hydrostatic forces when the tanks are empty. (See Appendix A.)

**2)** Where anchors and ground straps are used to resist uplift forces referred to in Sentence (1), they shall be

- a) electrically isolated from the tank, and
- b) installed in such a manner that they do not damage the protective coating on the tank.

**4.3.9. Corrosion Protection of Underground Steel Storage Tanks****4.3.9.1. Corrosion Protection**

**1)** Except as provided in Sentence (2), underground steel *storage tanks* and associated piping and fitting subject to corrosion shall be protected in conformance with CAN/ULC-S603.1, "Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids."

**2)** A steel *storage tank* not conforming to Sentence (1) is permitted provided

- a) it conforms to ULC/ORD-C58.10, "Jacketed Steel Underground Tanks for Flammable and Combustible Liquids," or
- b) it has corrosion protection conforming to good engineering practice such as described in PACE Report No. 87-1, "Impressed Current Method of Cathodic Protection of Underground Petroleum Storage Tanks," published by the Canadian Petroleum Products Institute.

**4.3.9.2. Testing**

**1)** No person shall backfill an underground *storage tank* until the electrical continuity between each anode and the *storage tank* has been tested.

**2)** All new installations of steel underground *storage tanks* shall be tested for adequate corrosion protection after the backfill is filled to the top of the *storage tank* but before the excavation is closed in and paved over.

**3)** Measurements shall be taken to ensure that a *cathodic protection* voltage potential of at least 850 millivolt negative to a copper/copper sulphate reference electrode is attained.

**4)** A certificate shall be provided to the owner of the *storage tank* by the person conducting the test referred to in Sentences (2) and (3) indicating that acceptable *cathodic protection* has been achieved.

**4.3.9.3. Installation**

**1)** No person shall add a new steel *storage tank* to an existing *storage tank system* that is protected by an impressed current *cathodic protection* system unless the tank

- a) conforms to CAN/ULC-S603, "Steel Underground Tanks for Flammable and Combustible Liquids,"
- b) is electrically bonded to the impressed current *cathodic protection* system, and
- c) has anodes to protect it.

(See Appendix A.)

**2)** No person shall install a *cathodically protected* steel *storage tank* near existing unprotected or sacrificial anode protected tanks or *storage tank systems* unless the new tank is

- a) electrically isolated from the existing system, and
- b) is *cathodically protected* in conformance with this Subsection.

(See Appendix A.)

**4.3.10. Vents for Underground Storage Tanks****4.3.10.1. Vent Design**

(See Appendix A.)

**1)** Underground *storage tanks* shall be provided with vent openings and piping of sufficient cross-sectional area designed to vent the tanks during the maximum filling or withdrawal rate without causing the allowable stress for the tank to be exceeded.

**4.3.10.2. Materials and Construction**

**1)** Vent piping materials and construction shall conform to Section 4.4.

**4.3.10.3. Installation**

**1)** Vent pipe outlets from underground *storage tanks* for Class I liquids

- a) shall be located outside *buildings* higher than the fill pipe openings but not less than
  - i) 3.5 m above the adjacent ground level,
  - ii) 1.5 m from any *building* opening, and
  - iii) 7.5 m from any dispenser, and
- b) shall discharge so that flammable vapours will not enter *building* openings or be trapped near any part of the *building*.

**2)** Vent pipe outlets from underground *storage tanks* for Class II or IIIA liquids shall be located outside *buildings* at a height that is above the fill pipe opening but not less than 2 m above finished ground level.

## 4.3.10.4.

3) Vent pipes from underground *storage tanks* for *flammable liquids* or *combustible liquids* shall not be obstructed by any device that may cause excessive back pressure, except that vent pipes from underground *storage tanks* for Class II or IIIA liquids are permitted to be fitted with return bends, coarse screens or other devices to minimize the entry of foreign material.

4) Vent piping shall enter the *storage tank* through the top of the tank and shall not extend into the tank more than 25 mm except when the vent is equipped with a vent alarm.

- 5) Vent piping shall be
- installed so that any nominally horizontal run shall slope towards the *storage tank*,
  - constructed without traps,
  - adequately supported to prevent sagging, and
  - where necessary, protected against mechanical damage.

### 4.3.10.4. Interconnection of Vent Pipes

1) Except as permitted in Sentence (2), where vent piping connects 2 or more *storage tanks*, pipe sizes shall be designed to vent the combined vapours produced in the connected underground *storage tanks* without exceeding the allowable stresses of the tanks when being filled simultaneously.

2) Where it is not possible to fill the connected *storage tanks* referred to in Sentence (1) simultaneously, or where the connected vents have a vapour recovery system, the vent piping shall be sized to accommodate the maximum vapour flow possible in the system.

3) Vent piping for an underground *storage tank* containing a Class I liquid shall not be connected to the vent piping for a *storage tank* containing a Class II or IIIA liquid unless an effective method is provided to prevent the vapours from the Class I liquid *storage tank* from entering the other tank.

### 4.3.11. Openings Other than Vents in Underground Storage Tanks

#### 4.3.11.1. Connections

1) Connections for all openings in underground *storage tanks* shall be liquid and vapour tight.

#### 4.3.11.2. Openings for Measuring Liquid Level

1) Openings for measuring liquid levels in underground *storage tanks* if independent of the fill pipe shall be equipped with a vapour-tight cap or

cover which shall be opened only when measuring the liquid level.

### 4.3.11.3. Fill Piping and Discharge Piping

1) Fill piping and discharge piping shall enter underground *storage tanks* only through the top of the tank and discharge piping used in suction systems shall be sloped toward the *storage tanks*.

2) Remote fill outlets from an underground *storage tank* shall not be located higher than other outlets from the tank.

3) Except as provided in Sentence (5), connections used as part of normal operating conditions for filling or emptying *storage tanks* for *flammable liquids* and *combustible liquids* shall be located

- outside *buildings*,
- at a location free of sources of ignition, and
- not less than 1.5 m away from *building* openings.

4) Connections for filling or emptying *storage tanks* described in Sentence (3) shall be kept closed to prevent leakage when not in use.

5) A filling connection described in Sentence (3) is permitted to be located inside a *building* if

- this is made necessary
  - by a process or activity located indoors and to which the tank is directly associated, or
  - for the collection of used liquids, and
- the fill piping is provided with means to prevent flammable vapours from returning to the *building*.

### 4.3.12. Installation of Storage Tanks inside Buildings

#### 4.3.12.1. Occupancy

1) Except as provided in Article 4.3.12.2., *storage tanks* shall not be permitted in other than *industrial occupancies*.

2) Except as provided in Sentence (3), rooms and *floor areas* used for storage of *flammable liquids* in *storage tanks* inside *buildings* shall be classified as Group F, Division 1 *occupancies* in conformance with the Alberta Building Code. (See Appendix A.)

3) Subject to Subsection 4.1.7. and Articles 4.3.5.2. and 4.3.6.4., *storage tank systems* used for the collection of used lubricating oil are permitted inside *buildings* classified as Group F, Division 2 and Division 3 *occupancies*.

**4.3.12.2. Stationary Combustion Engines**

1) *Storage tank systems* using Class I liquids as fuel supplies for stationary engines inside *buildings* shall conform to this Part when they are used to supply appliances installed in conformance with NFPA 37, "Installation and Use of Stationary Combustion Engines and Gas Turbines."

2) *Storage tank systems* for Class II and IIIA liquids inside *buildings* shall conform to this Part when they are used to supply appliances installed in conformance with CAN/CSA-B139-M, "Installation Code for Oil Burning Equipment."

- a) located in dedicated storage rooms conforming to Subsection 4.3.13., and
- b) located in conformance with Table 4.3.12.4.

2) When quantities greater than are permitted for incidental use in Subsection 4.2.8. are required for special process operations, *storage tanks* for *flammable liquids* or *combustible liquids* are permitted to be located outside of a storage room referred to in Sentence (1), provided that

- a) total quantities per *fire compartment* are not more than one-half the quantities permitted in Table 4.3.12.4.,
- b) they are located on the *first storey*, and
- c) the installation conforms to Articles 4.3.12.7. to 4.3.12.10. and Article 4.3.13.4.

**4.3.12.3. Maximum Static Head**

1) The static head imposed on a *storage tank* inside a *building* shall not exceed 70 kPa (gauge) at the bottom of the tank when the vent or fill pipe is filled with liquid unless the tank is designed for greater pressures.

**4.3.12.4. Maximum Quantities and Location**

1) Except as provided in Subsection 4.2.8. and in Sentence (2), *storage tanks* for *flammable liquids* or *combustible liquids* shall be

**Table 4.3.12.4.**  
**Indoor Tank Storage**  
Forming Part of Sentences 4.3.12.4.(1) and (2), and 4.3.12.6.(1)

Class of Liquid	Storage Level	Maximum Quantity per Storage Room <sup>(1)</sup> , L	
		One or More Tanks	
		Protected <sup>(2)</sup>	Unprotected Storage
Class I	<i>First storey</i>	40 000	25 000
	<i>Storeys above the first storey</i>	7 500	Not Permitted
	<i>Basement</i>	Not Permitted	Not Permitted
Class II and IIIA	<i>First storey</i>	200 000	100 000
	<i>Storeys above the first storey</i>	20 000	Not Permitted
	<i>Basement</i>	20 000	Not Permitted

**Notes to Table 4.3.12.4.:**

(1) See Subsection 4.3.13.

(2) See Article 4.2.7.7.

## 4.3.12.5.

### 4.3.12.5. Fire Compartments

1) *Fire compartments* regulated by this Subsection shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* of not less than 2 h.

### 4.3.12.6. Mixed Storage

1) When 2 or more classes of liquids are stored in a single storage room referred to in Sentence 4.3.12.4.(1), the total quantity permitted for each class of liquid shall be calculated as follows:

$$\frac{q_I}{Q_I} + \frac{q_{II+III A}}{Q_{II+III A}} \leq 1$$

where

- $q_I$  = the actual quantity of Class I liquid present,
- $q_{II+III A}$  = the actual quantity of Class II and IIIA liquid present,
- $Q_I$  = the maximum quantity of Class I liquid permitted in Table 4.3.12.4.,
- $Q_{II+III A}$  = the maximum quantity of Class II and IIIA liquid permitted in Table 4.3.12.4.

### 4.3.12.7. Storage Tanks outside Storage Rooms

- 1) Where *storage tanks* for *flammable liquids* or *combustible liquids* are located outside of storage rooms conforming to Subsection 4.3.13.,
- a) provision shall be made to contain 100% of the volume of the largest *storage tank*, or to drain away spilled *flammable liquids* or *combustible liquids* in conformance with Subsection 4.1.6.,
  - b) all electrical equipment and wiring in the vicinity of the *storage tank* and the exterior vent shall be installed in conformance with Subsection 4.1.4., and
  - c) the *floor area* in which the *storage tank* is located shall be ventilated in conformance with Subsection 4.1.7.

### 4.3.12.8. Vents

- 1) Except as provided in Sentence (2), normal and emergency vents for *storage tanks* in *buildings* shall be provided in conformance with
- a) Subsections 4.3.4. and 4.3.5. and the applicable requirements in Subsection 4.3.10., or
  - b) good engineering practice for emergency venting of *storage tanks* inside *buildings*.
- (See Appendix A.)

2) The use of weak roof-to-side shell seams, designed to rupture before the allowable design stress of the *storage tank* is reached, shall not be permitted as a means of emergency venting of *storage tanks* inside *buildings*.

### 4.3.12.9. Supports, Foundations and Anchorage

- 1) Except as provided in Sentence (2), where *storage tanks* for *flammable liquids* or *combustible liquids* are installed inside *buildings*, the supports, foundations and anchorage for such *storage tanks* shall be in conformance with Subsection 4.3.3.
- 2) Where a *storage tank* is suspended, rather than supported on a foundation, supports shall be designed and installed in conformance with good engineering practice. (See Appendix A.)

### 4.3.12.10. Bonding and Grounding

1) Where *storage tanks* for *flammable liquids* or *combustible liquids* are installed inside *buildings*, tanks, piping and discharge equipment shall be bonded and grounded.

## 4.3.13. Rooms for Storage Tanks

### 4.3.13.1. Design and Construction

- 1) Rooms for *storage tanks* inside *buildings* shall be designed and constructed in accordance with the Alberta Building Code.
- 2) Rooms described in Sentence (1) shall be used for no other purposes than the storage and handling of *flammable liquids* or *combustible liquids*.

### 4.3.13.2. Clearances

1) A minimum clear space of 550 mm shall be maintained between the walls of a room described in Article 4.3.13.1. and the sides of any *storage tanks* within the room.

### 4.3.13.3. Explosion Venting

1) Where Class IA or IB liquids are dispensed within a storage room, the room shall be designed to prevent critical structural and mechanical damage from an internal explosion in conformance with good engineering practice such as described in NFPA 68, "Venting of Deflagrations." (See A-3.2.8.2.(1)(d) in Appendix A.)

### 4.3.13.4. Hose Stations and Portable Extinguishers

- 1) In *buildings* not required to be equipped with a standpipe and hose system by the Alberta Building Code, hose stations conforming to Article 6.2.3.4. shall be provided in the vicinity of the storage room, such that all parts of the room are within reach of a hose stream. (See Appendix A.)
- 2) Portable extinguishers for *Class B fires* shall be provided in conformance with Part 6.

**4.3.13.5. Placards**

1) Placards conforming to Article 3.2.7.14., identifying the liquids stored as *flammable liquids* or *combustible liquids* and the capacities of the *storage tanks*, shall be posted in a conspicuous location outside of the room, and that information shall be included in the fire safety plan required in Article 4.1.5.6.

**4.3.14. Openings Other than Vents in Storage Tanks in Buildings****4.3.14.1. Connections**

- 1) Connections for all openings in *storage tanks* in *buildings* shall be liquid and vapour tight.
- 2) Connections to *storage tanks* through which liquid can flow shall be provided with valves located as close as practicable to the tank.

**4.3.14.2. Openings for Liquid Level Measurement**

- 1) Openings that are independent of the fill pipe and are used for measuring the liquid level in *storage tanks* containing Class I or II liquids shall be equipped with a vapour-tight cap which shall be opened only when measuring the liquid level.
- 2) Openings referred to in Sentence (1) shall be protected against overflow and vapour pressure by means of a spring-loaded check valve.

**4.3.15. Leakage Testing of Storage Tanks****4.3.15.1. Leakage Testing**

- 1) Except as provided in Sentences (2) and (3), every *storage tank* shall be tested by a precision leak test method and in conformance with this Subsection when
- a) the final installation including backfill and surfacing has been completed,
  - b) a product leak is suspected, or
  - c) there are indications of a leak as identified in Article 4.3.16.3.

(See Appendix A.)

2) Except as provided in Sentence (3), where liquid level measurements in Subsection 4.3.16. indicate a leak, the source of leakage from an aboveground *storage tank* may be determined by a visual examination of the tank shell and, where the bottom is not amenable to such examination, by testing the bottom of the tank. (See Appendix A.)

3) Where field test methods are included in the tank construction standards referred to in Articles 4.3.1.2. and 4.3.1.3., such tests shall be

permitted for *storage tanks* conforming to those standards.

**4.3.15.2. Pneumatic Leakage Tests**

- 1) Pneumatic leakage tests shall not be performed on field-erected aboveground *storage tanks*.
- 2) Pneumatic leakage tests shall not be performed on *storage tanks* with *flammable liquids* or *combustible liquids* in the tanks.
- 3) Where a pneumatic leakage test is performed on an underground *storage tank*, the tank shall be considered to be leaking when the test indicates a pressure drop within a 2 h period after steady temperature conditions have been established and the source of pressure has been removed.
- 4) Pneumatic test pressures applied to underground *storage tanks* shall be measured by an instrument calibrated in increments of not more than 1 kPa.
- 5) Where a pneumatic leakage test is conducted before an underground tank is backfilled in the case of a new tank, or after the tank is uncovered in the case of a previously installed tank, the test pressure shall be in conformance with the production testing requirements of
- a) CAN/ULC-S603, "Steel Underground Tanks for Flammable and Combustible Liquids," or
  - b) CAN4-S615-M, "Reinforced Plastic Underground Tanks for Petroleum Products."

6) Where a pneumatic leakage test is performed on a completely buried *storage tank*, the test pressure shall be not less than 35 and not more than 70 kPa (gauge).

7) Measures shall be taken to guard against the hazards associated with pneumatic leakage testing where explosive mixtures of vapours from *flammable liquids* or *combustible liquids* and air may be present in the area of a tank that has been in use.

**4.3.15.3. Liquid Media Leakage Tests**

1) Where a leakage test incorporating a liquid test medium, including a *flammable liquid* or *combustible liquid*, is performed on an underground *storage tank*, the tank shall be considered to be leaking when, with compensation for volume differentials caused by effects of temperature and tank shell distortion, the test indicates a liquid loss.

2) The pressure at the bottom of a *storage tank* shall not exceed 70 kPa (gauge) during the leakage test referred to in Sentence (1).

## 4.3.15.4.

### 4.3.15.4. Retention of Records

1) Records of tests referred to in Article 4.3.15.1. shall be retained for examination by the *authority having jurisdiction*, in conformance with Article 1.1.1.2.

### 4.3.15.5. Remedial Action

1) When a leak is detected in a *storage tank* by a leakage test required in this Subsection or by a leakage detection measure required in Subsection 4.3.16.,

- a) the *storage tank* shall
  - i) be removed or replaced, in the case of an underground tank, or
  - ii) be removed, repaired or replaced, in the case of an aboveground tank, and
- b) the escaped liquid shall be removed in conformance with Article 4.1.6.3.

2) The *authority having jurisdiction* shall be notified within 24 h of detection of a leak referred to in Sentence (1).

### 4.3.16. Leakage Detection of Storage Tanks

#### 4.3.16.1. Liquid Level Measurements (See Appendix A.)

1) Except as provided in Article 4.3.16.2., the liquid level in any *storage tank* shall be measured at intervals not greater than 7 days in conformance with Sentences (2) to (4), except that at *fuel dispensing stations* the measurements shall be taken each day the station is in operation.

2) The level of water at the bottom of an underground *storage tank* shall be measured at intervals not greater than 7 days, except that at *fuel dispensing stations* the measurements shall be taken each day the station is in operation.

3) A comparison of the measurements described in Sentences (1) and (2) with meter readings and a computation of any gain or loss of liquid shall be done each time a required measurement is taken.

4) A record for each *storage tank* showing the measurements and computations described in Sentence (3) shall be retained for examination by the *authority having jurisdiction*, in conformance with Article 1.1.1.2.

5) The record referred to in Sentence (4) shall be the subject of an audit acceptable to the *authority having jurisdiction* at least annually.

6) The audited record referred to in Sentence (5), together with inventory reconciliation data and confirmation of delivery documentation shall be made available to the *authority having jurisdiction* in accordance with Article 1.1.1.2.

7) The provisions of this Article do not apply to a *storage tank* which has been taken out of service in compliance with the applicable provisions of Section 4.10.

#### 4.3.16.2. Continuous Leakage Detection

1) The measurements described in Article 4.3.16.1. are not required for an underground *storage tank* when

- a) it is provided with a continuous leakage detection device conforming to
  - i) ULC/ORD-C58.12, "Leak Detection Devices (Volumetric Type) for Underground Flammable Liquid Storage Tanks," or
  - ii) ULC/ORD-C58.14, "Nonvolumetric Leak Detection Devices for Underground Flammable Liquid Storage Tanks," and
- b) its associated underground piping is provided with continuous leakage detection conforming to Article 4.4.6.7.

#### 4.3.16.3. Notification

1) The *owner* of a *storage tank* shall immediately notify the *authority having jurisdiction* in the event of a spill of more than 50 L in accordance with Sentence 4.1.6.3.(5) or within 24 h after a leak or discharge is suspected, as indicated by any one of the following:

- a) any unexplained loss or gain of 0.5 per cent or more of the throughput from an underground *storage tank* or a loss of 2.0 per cent or more of the throughput from an aboveground *storage tank*, for each stored product in a calendar month, as indicated by the recording and reconciliation of inventory records, done in conformance with Sentence 4.3.16.1.(3),
- b) inventory reconciliations showing five consecutive days of unexplained product losses,
- c) inventory reconciliations showing 18 days of unexplained losses in one calendar month,
- d) the level of water at the bottom of an underground *storage tank* exceeds 50 mm,
- e) failure of a precision leakage test which indicates a loss or gain of product (see A-4.3.15.1.(1) in Appendix A),
- f) failure of a hydrostatic piping test,
- g) analysis or other evidence of product in a monitoring well or drinking water well,

- h) the presence of free or dissolved product onsite or offsite in the soil, groundwater, surface water, sewer lines, utility lines, water supply lines, *basements*, crawl space or on the ground surface, or
- i) the signal of any warning systems associated with monitoring devices.

**2)** A person shall forthwith report to the *authority having jurisdiction* and the fire department if he has information about a leak of *flammable liquid* or *combustible liquid* that

- a) is based on analysis or other evidence of *flammable liquid* or *combustible liquid* in a monitoring well or a water well, or
- b) indicates the presence of free or dissolved *flammable liquid* or *combustible liquid* in soil, groundwater, surface water, sewer lines, utility lines, water supply lines, *basements*, crawl space or on the ground surface.

(See A-4.1.6.3.(5)(b) in Appendix A.)

#### 4.3.16.4. Corrective Action

- 1)** Immediate corrective action shall be taken in conformance with Subsection 4.3.15.5. when
- a) a loss of liquid or a gain of water is indicated by any of the leakage detection measures described in Articles 4.3.16.1. and 4.3.16.2., or
  - b) the level of water at the bottom of an *underground storage tank* exceeds 50 mm.

### 4.3.17. Upgrading of Existing Underground Storage Tank Systems

#### 4.3.17.1. Application

**1)** Except as provided in Sentence 4.1.1.1.(3), this Subsection applies to all *flammable liquid* and *combustible liquid underground storage tank systems* that are not constructed or installed in conformance with this Part.

#### 4.3.17.2. General

**1)** No person shall alter or install an *underground storage tank system* unless approvals have been obtained in conformance with Article 4.1.1.2.

#### 4.3.17.3. Storage Tank Systems

**1)** The site of an existing *underground storage tank system* shall be assigned a site sensitivity classification as specified in Article 4.3.8.1.

**2)** An existing *underground storage tank system* located at a site with a site sensitivity classification of Class A shall be removed, replaced or upgraded within the time specified in Table 4.3.17.3.

**3)** An existing *underground storage tank system* located at a site with a site sensitivity classification of Class B shall be removed, replaced or upgraded within the time specified in Table 4.3.17.3.

**4)** *Underground storage tank systems* identified in Sentences (2) and (3) may be upgraded at the time specified in Table 4.3.17.3., whichever is appropriate to the site sensitivity classification assigned, and shall include the following:

- a) corrosion protection in conformance with Articles 4.3.9.1. and 4.4.3.1., if applicable,
- b) *overflow protection devices* in accordance with Clause 4.3.8.1.(6)(c),
- c) *spill containment devices* in accordance with Clause 4.3.8.1.(6)(d),
- d) leak detection in accordance with Clause 4.3.8.1.(6)(e),
- e) line leak detection on pressurized or suction piping systems in accordance with Clause 4.3.8.1.(6)(f), and
- f) liquid and vapour tight adapters and caps.

**Table 4.3.17.3.**  
**Upgrading of Underground Storage Tanks**  
Forming part of Sentences 4.3.17.3.(2), (3) and (4)

Age of Tank on August 31, 1992	Upgrade, Replace or Remove	
	Class "A"	Class "B"
≥ 25 or unknown	August 31, 1994	August 31, 1996
15 - 24	August 31, 1995	August 31, 1997
5 - 14	August 31, 1996	August 31, 1998
0 - 4	August 31, 1997	August 31, 1999

#### 4.4.1.1.

## Section 4.4. Piping and Transfer Systems

### 4.4.1. Scope

#### 4.4.1.1. Application

1) This Section applies to piping and transfer systems for *flammable liquids* and *combustible liquids*.

2) Except where otherwise stated in this Part, this Section shall not apply to the following:

- tubing or casings and piping for oil or gas wells,
- piping for vehicles, aircraft, watercraft and portable or stationary engines,
- piping systems in *distilleries*, and
- piping within the scope of the boiler and *pressure vessel* regulations made pursuant to the Safety Codes Act.

### 4.4.2. Materials for Piping, Valves and Fittings

#### 4.4.2.1. Materials

1) Materials for piping systems containing *flammable liquids* or *combustible liquids* shall be suitable for the maximum anticipated working pressures and operating temperatures and for the chemical properties of the contained liquid.

2) Except as provided in Sentence (3), the use of the following materials for piping systems referred to in Sentence (1) shall not be permitted:

- materials that are subject to failure from internal stress or rupture by mechanical damage, or
- combustible or low-melting-point materials that are subject to failure even in moderate fires.

3) Non-metallic piping systems are permitted to be used for underground installations provided they conform to

- ULC/ORD-C107.7, "Glass Fibre Reinforced Plastic Pipe and Fittings for Flammable and Combustible Liquids," or
- ULC/ORD-C107.4, "Ducted Flexible Underground Piping Systems for Flammable and Combustible Liquids."

4) Except as provided in Sentence (5), where steel piping is used, it shall conform to

- API 5L, "Line Pipe,"
- ASTM A 53, "Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless," or
- CSA Z245.1, "Steel Line Pipe."

5) Where service pressures exceeding 875 kPa (gauge) may occur, piping and fittings shall

be designed in conformance with ANSI/ASME B31.3, "Chemical Plant and Petroleum Refinery Piping."

### 4.4.2.2. Special Materials

1) Where problems of corrosion, contamination, or sanitation or standards of purity require special materials, it is permitted to use non-metallic materials for piping, valves and fittings in conformance with Subsection 1.1.2.

### 4.4.3. Corrosion Protection of Piping Systems

#### 4.4.3.1. Corrosion Protection

1) Except as provided in Sentence (2), all exposed and underground piping, valves, couplings, flanges and bolts for *flammable liquids* or *combustible liquids* shall be protected against external corrosion.

2) Underground steel piping, valves and fittings shall be protected against corrosion in conformance with

- CAN/ULC-S603.1, "Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids," or
- good engineering practice such as described in PACE Report No. 87-1, "Impressed Current Method of Cathodic Protection of Underground Petroleum Storage Tanks," published by the Canadian Petroleum Products Institute.

### 4.4.4. Identification of Piping Systems

#### 4.4.4.1. Identification

1) Pipelines for *flammable liquids* or *combustible liquids* shall be marked with the contents of the line, and these markings shall be maintained in a clearly legible form.

2) Piping for *flammable liquids* or *combustible liquids* shall not be painted red.

3) Transfer points in piping systems for *flammable liquids* and *combustible liquids* shall be identified in conformance with CPPI, "Using the CPPI Colour-Symbol System to Mark Equipment and Vehicles for Product Identification."

#### 4.4.4.2. Plans

1) Plans showing piping systems for *flammable liquids* or *combustible liquids*, including tank and pumping arrangements, shall be available to the fire department on request.

2) Sets of plans shall be kept at 2 separate locations.

## 4.4.5. Joints in Piping Systems

### 4.4.5.1. Threaded Joints

1) Threaded joints in piping systems for *flammable liquids* or *combustible liquids* shall be made using joint compound or polytetrafluoroethylene tape conforming to CAN/ULC-S642-M, "Compounds and Tapes for Threaded Pipe Joints."

### 4.4.5.2. Welded Piping

1) Welding of piping for *flammable liquids* or *combustible liquids* shall conform to Section 5.2. and the appropriate requirements of

- a) the Occupational Health and Safety Act and its Regulations,
- b) API 1104, "Welding Pipelines and Related Facilities," and
- c) API RP 1107, "Recommended Pipeline Maintenance Welding Practices."

2) Flanged joints for piping shall be provided in welded systems at intervals which will facilitate dismantling and avoid subsequent in-place cutting and welding operations.

### 4.4.5.3. Flanged Joints

1) Except as permitted in Sentence (2), flanged joints for piping shall be made with forged or cast steel flanges designed, constructed and installed in conformance with ANSI/ASME B16.5, "Pipe Flanges and Flanged Fittings."

2) Bronze flanges for 50 mm diameter or smaller size piping referred to in Article 4.4.5.2. are permitted to be used where copper and brass piping is permitted.

### 4.4.5.4. Bolting Materials

1) Bolting materials for flanged connections in steel piping systems for *flammable liquids* or *combustible liquids* shall be of alloy steel equivalent to ASTM A 193/A 193M, "Alloy-Steel and Stainless Steel Bolting Materials for High Temperature Service," Grade B-7.

### 4.4.5.5. Gaskets

1) Gaskets in flanged connections shall be of a material resistant to the liquid being carried and capable of withstanding temperatures of 650°C and above without damage.

## 4.4.6. Leakage Testing of Piping Systems

### 4.4.6.1. Leakage Testing

1) Piping systems shall be tested for leakage in conformance with this Subsection

- a) whenever a leak is suspected, and

- b) at the time of installation
  - i) before backfilling in the case of underground piping, in accordance with Article 4.4.6.4.,
  - ii) after backfill and surfacing have been completed, and
  - iii) before putting into service in the case of exposed piping.

2) Exposed piping systems in service are permitted to be visually inspected for leakage in conformance with Article 4.4.11.5.

### 4.4.6.2. Retention of Records

1) Records of the pressure tests on piping systems shall be retained for examination by the *authority having jurisdiction*, in conformance with Article 1.1.1.2.

### 4.4.6.3. Remedial Action

1) If a leak is detected in a piping system during the leakage test, the piping system shall be repaired or replaced and the escaped liquid shall be removed in conformance with Subsection 4.1.6.

### 4.4.6.4. Pneumatic Leakage Tests

1) Pneumatic leakage tests shall not be performed on storage system piping which contains *flammable liquid* or *combustible liquid*.

2) When exposed piping systems are subjected to a pneumatic leakage test, the piping, including all joints, shall be soaped to assist in the detection of leaks.

3) Piping systems being tested by a pneumatic leak test method shall be considered to be leaking when the test indicates a pressure drop or volume loss within a 2 h period after steady temperature conditions have been established and the source of pressure has been removed.

4) Pressure measurements referred to in Sentence (3) shall be obtained by using instruments calibrated in increments of not more than

- a) 4 kPa for test pressures up to 700 kPa (gauge), and
- b) 1% of the test pressure where it exceeds 700 kPa (gauge).

5) Test pressures exceeding 700 kPa (gauge) shall not be permitted except when the piping system is designed for such pressures.

6) Where test pressures exceed the design pressures for pumps or similar components included in the piping system being tested, such pumps or components shall be isolated from the remainder of the system.

## 4.4.6.5.

### 4.4.6.5. Liquid Media Leakage Tests

- 1) Where a leakage test incorporating a liquid test medium, including a *flammable liquid* or *combustible liquid* is performed, the pipe shall be considered to be leaking if the leak rate is determined to be greater than 0.38 L/h after
  - a) product in the line has been allowed sufficient time for temperature stabilization,
  - b) mechanical leak detectors have been removed,
  - c) a hand pump has been used to pressurize the line to a minimum 350 kPa (gauge) or 1.5 times the maximum operating pressure, whichever is greater,
  - d) any vapour in the line has been removed, and
  - e) the amount of liquid added in 10 min. intervals to maintain 350 kPa pressure is recorded.
- 2) Test pressures exceeding 700 kPa (gauge) shall not be permitted except when the piping system is designed for such pressures.
- 3) Where test pressures exceed the design pressures for pumps or similar components included in the piping system being tested, such pumps or components shall be isolated from the remainder of the system.

### 4.4.6.6. Class I Liquids as a Test Medium

- 1) Class I liquids shall not be used for pressure testing piping systems, except that pressure piping normally containing Class I liquids is permitted to be tested with such liquids at pressures not exceeding their maximum operating pressures.

### 4.4.6.7. Leakage Detection

- 1) When an underground piping system is provided with continuous leakage detection, it shall be in conformance with ULC/ORD-C107.12, "Line Leak Detection Devices for Flammable Liquid Piping."

## 4.4.7. Location and Arrangement of Piping

### 4.4.7.1. Location

- 1) Piping shall be installed outdoors whenever possible and located so it will not create a hazard to *buildings* or equipment.
- 2) Where piping for *flammable liquids* or *combustible liquids* is installed within a *building*, the length of piping shall be as direct and as short as practicable.

### 4.4.7.2. Supports for Aboveground Outdoor Piping

- 1) Aboveground outdoor piping shall be supported and arranged to prevent excessive vibration and stress on equipment connected to it.
- 2) When vehicular impact or physical damage is possible, protective guarding devices shall be provided for piping referred to in Sentence (1) and for fill pipes for *storage tanks*.

### 4.4.7.3. Arrangement of Aboveground Outdoor Piping

- 1) Aboveground outdoor piping shall not be located
  - a) on the exterior of walls except on those of *noncombustible construction*, or
  - b) above windows.
- 2) Aboveground outdoor piping shall not be located above roofs except above roofs of impermeable and *noncombustible construction*, with provision for accidental spillage provided in conformance with Subsection 4.1.6.
- 3) Where aboveground piping crosses roadways or railway sidings, ample overhead clearance and warning signs indicating the clearance height shall be provided.

- 4) Piping passing through secondary containment walls shall be designed to prevent excessive stress resulting from settlement or fire exposure.

### 4.4.7.4. Underground Piping

- 1) Underground piping shall be located so it will not be damaged as a result of vibrations or settling of an adjacent *building* or structure.
- 2) Underground piping shall be located not less than 300 mm away from the foundations of any *building* or structure, except where such piping enters the *building* as permitted in Article 4.4.7.7.
- 3) Piping passing under railway tracks shall be installed in conformance with CTC 1977-3 RAIL, "Pipe Crossings Under Railways (No. E-10) Regulations," of Transport Canada.
- 4) Piping adjacent to railway tracks shall be installed in conformance with General Order No. O-32, "Flammable Liquids Bulk Storage Regulations," of Transport Canada.

### 4.4.7.5. Installation of Underground Piping

- 1) Underground piping shall be
  - a) supported on undisturbed or compacted soil, and
  - b) backfilled on the top and sides with not less than

- i) 300 mm of pea gravel or clean crushed stone, or
- ii) 300 mm of clean sand, free of cinders and stones and compacted in layers not more than 300 mm thick.

**2)** Where it is not practicable to support piping as required in Sentence (1) on undisturbed soil, it shall be supported on not less than 150 mm of clean sand, pea gravel or washed, crushed stone.

#### 4.4.7.6. Piping in Service Tunnels

**1)** Piping for *flammable liquids* or *combustible liquids* shall not be located in service tunnels that are used for pedestrian traffic.

#### 4.4.7.7. Piping at Entrances to Buildings

**1)** Piping for *flammable liquids* or *combustible liquids* shall be located aboveground where the piping enters a *building*.

**2)** Piping referred to in Sentence (1) shall be provided with inside and outside shut-off valves.

**3)** Where piping referred to in Sentence (1) passes through a wall which would restrict the expansion or contraction of the piping, pipe sleeves shall be provided at the wall penetration to facilitate such movement.

#### 4.4.7.8. Indoor Piping

**1)** Indoor piping for *flammable liquids* or *combustible liquids* shall either be supported overhead or be located in trenches conforming to Article 4.4.7.9.

**2)** Piping referred to in Sentence (1) shall not be installed under combustible flooring.

#### 4.4.7.9. Piping in Trenches

**1)** Where indoor piping for *flammable liquids* or *combustible liquids* is installed in trenches, a trapped drainage system conforming to Subsection 4.1.6. shall be provided.

**2)** When piping referred to in Sentence (1) contains Class I liquids, the trench shall be

- a) provided with positive ventilation to the outdoors, or
- b) designed to prevent the accumulation of flammable vapours.

#### 4.4.7.10. Overhead Piping

**1)** Overhead piping for *flammable liquids* or *combustible liquids* shall be installed close to the ceiling or beams or along walls not less than 1.8 m above the floor to protect it against mechanical damage.

**2)** Where practicable, overhead piping referred to in Sentence (1) shall be supported from *building* framing members.

**3)** In *buildings* of steel frame construction, piping referred to in Sentence (1) shall be fastened to steel beams or columns by pipe hangers attached to the flanges.

**4)** Piping under concrete ceilings shall be suspended with the use of through bolts or expansion shields.

#### 4.4.7.11. Supports for Overhead Piping

**1)** Piping shall be supported on pipe hangers or other supports so that allowable stresses in the pipe are not exceeded. (See Appendix A.)

**2)** Anchors of the expansion shield type used to suspend piping shall not be used to suspend piping from unsound or lightweight concrete or from gypsum assemblies.

#### 4.4.7.12. Protection of Pipe Risers

**1)** Exposed pipe risers shall be protected against mechanical damage by

- a) installing such risers
  - i) adjacent to walls or pilasters,
  - ii) between flanges of steel columns, or
  - iii) within securely anchored larger perforated pipe, and
- b) providing mechanical guards where the risers are exposed to mobile equipment.

#### 4.4.7.13. Provision for Expansion and Contraction

**1)** In the design of *flammable liquid* or *combustible liquid* piping systems, provision shall be made for thermal expansion and contraction.

**2)** Flexible hose connectors conforming to CAN/ULC-S633-M, "Flexible Underground Hose Connectors for Flammable and Combustible Liquids" are permitted to be used where necessary in systems carrying *flammable liquids* or *combustible liquids* to prevent excessive stresses resulting from vibration, settling or temperature changes.

### 4.4.8. Valves in Piping Systems

#### 4.4.8.1. Design

**1)** Except as provided in Sentences (2) and (3), valves in piping systems for *flammable liquids* or *combustible liquids* shall be designed to accommodate the temperatures and pressures of those systems and shall conform to ULC-C842-M, "Valves for Flammable and Combustible Liquids."

**2)** Every hose nozzle valve shall conform to CAN/ULC-S620-M, "Hose Nozzle Valves for Flammable and Combustible Liquids."

## 4.4.8.2.

3) Every emergency valve shall conform to CAN/ULC-S651-M, "Emergency Valves for Flammable and Combustible Liquids."

### 4.4.8.2. Shut-Off Valves

1) Shut-off valves shall be provided in all *flammable liquid* or *combustible liquid* piping and pumping systems.

2) Where practicable, valves referred to in Sentence (1) shall be located outdoors or be immediately accessible from outdoors.

3) Except as permitted in Sentence (4), steel shut-off valves shall be provided

- a) at connections to all aboveground *storage tanks*,
- b) on supply piping where it enters *buildings* or structures,
- c) on branch lines from the main supply line,
- d) on supply lines at dispensing locations, and
- e) to isolate one part of a piping system from another.

4) Stainless steel, monel metal or lined steel bodied valves are permitted to be used when special conditions warrant their use.

### 4.4.8.3. Diaphragm Valves

1) Diaphragm valves shall have no direct connections between the liquid and air sections that might permit leakage of the liquid past the packing into the air lines.

### 4.4.8.4. Globe Valves

1) Globe valves shall be arranged so that the packing is on the low pressure side.

### 4.4.8.5. Indicating Valves

1) Rising stem or other indicating valves shall be used where necessary to determine whether the valves are open or shut.

### 4.4.8.6. Meters

1) Where cast iron meters are used, they shall be isolated by the use of steel valves.

### 4.4.8.7. Identification

1) All valves shall be identified in conformance with CPPI, "Using the CPPI Colour-Symbol System to Mark Equipment and Vehicles for Product Identification."

2) Every identification tag shall be kept clean so that its colour and inscription are easily recognizable.

## 4.4.9. Heating of Piping Systems

### 4.4.9.1. Design

1) Heating equipment for piping systems containing *flammable liquids* or *combustible liquids* shall be designed not to overheat or create an ignition source for the liquids being heated.

### 4.4.9.2. Steam Heating

1) *Flammable liquid* and *combustible liquid* piping is permitted to be heated by steam lines provided the minimum steam temperature and pressure to make the liquid fluid are used and Sentences (2) and (3) are complied with.

2) A pressure regulator shall be provided in the steam line with a relief valve on the downstream side of the regulator.

3) Piping and steam lines shall be enclosed in insulation conforming to the Alberta Building Code.

### 4.4.9.3. Electrical Heating Cables

1) Electrical heating cables including electrical induction heating shall conform to Subsection 4.1.4.

### 4.4.9.4. Thermal Electrical Conduction Heating

1) Thermal electrical conduction heating conforming to Sentence (2) is permitted to be used by passing a low-voltage alternating current through the pipe.

2) Systems permitted in Sentence (1) shall be installed and tested as complete units and shall conform to the following:

- a) unheated sections of piping shall be isolated from heated sections by means of nonconductive fittings;
- b) thermostatic controls, high temperature limit controls and fuses shall have the lowest practical rating to ensure satisfactory operation;
- c) all parts of the piping and fittings shall be enclosed by insulating coverings of a type which will prevent accidental grounding of the systems; and
- d) switches, transformers, contactors and other spark-producing equipment shall be located in an area not subject to flammable vapours.

3) Upon completion of installation, systems permitted in Sentence (1) shall be tested to ensure that all components are functioning as intended.

**4.4.9.5. Open Flames**

1) The use of open flames as a heat source shall not be permitted for heating piping for *flammable liquids* or *combustible liquids*.

**4.4.10. Methods of Transfer in Piping Systems****4.4.10.1. Location of Outdoor Pumps**

1) Pumps for *flammable liquid* or *combustible liquid* piping systems installed aboveground and outside of *buildings* shall be located not less than

- a) 3 m from the property line, and
- b) 1.5 m from *building* openings.

**4.4.10.2. Pump Houses and Pump Rooms**

1) Pumps located indoors shall be in rooms that conform to Subsection 4.2.9.

2) Pump houses and pump rooms shall not be used for any purpose other than to serve the pumping equipment.

**4.4.10.3. Pits**

1) Pits for subsurface pumps for piping systems or for piping connected to submersible pumps shall be designed to withstand the forces to which they may be subjected without causing damage to the system.

2) Pits provided in conformance with Sentence (1) shall not be larger than necessary for inspection and maintenance and shall be provided with a cover.

**4.4.10.4. Control Switches**

1) Pumps for piping systems shall be provided with duplicate control switches to shut down the pumps in case of emergency, with one located in the operating area and the other at a remote location.

**4.4.10.5. Hydraulic Transfer Systems**

1) Where *flammable liquids* or *combustible liquids* are transferred by water pressure as a result of displacement, such system shall not be used for liquids that are miscible in water.

2) All *pressure vessels* for hydraulic transfer systems referred to in Sentence (1) shall be constructed, installed and tested in conformance with boiler and pressure vessel regulations made pursuant to the Safety Codes Act.

3) Hydraulic transfer systems referred to in Sentence (1) shall be designed to prevent water pressure in excess of the design pressure of the tank or piping.

4) Operating pressures shall be controlled by a constant-level float valve or a pressure-regulating valve on the water supply side of the hydraulic transfer system referred to in Sentence (1).

5) Hydraulic transfer systems referred to in Sentence (1) shall be arranged so that there is no water pressure on the system except when liquid is being discharged.

6) Check valves shall be provided for both water and *flammable liquid* or *combustible liquid* piping to prevent back-flow in hydraulic transfer systems referred to in Sentence (1).

**4.4.10.6. Inert Gas Transfer Systems**

1) Where *flammable liquids* or *combustible liquids* are transferred as a result of displacement by the expansion of nitrogen, carbon dioxide or other inert gases, all *pressure vessels* involved shall be constructed, installed and tested in conformance with boiler and pressure vessel regulations made pursuant to the Safety Codes Act.

2) Pressure regulators for inert gas transfer systems referred to in Sentence (1) shall be provided in the gas line to control the pressure of the gas at the minimum pressure required to force the liquid through the piping system at the required rate.

3) A relief valve with a slightly higher setting than the pressure required in Sentence (1) shall be provided on the downstream side of the regulator or on the tank.

4) Means of automatically shutting off the gas supply and bleeding the gas pressure in the event of fire shall be provided on all inert gas transfer systems referred to in Sentence (1).

**4.4.10.7. Non-Inert Gas Transfer**

1) Except as permitted in Sentence (2), the transfer of *flammable liquids* or *combustible liquids* in a closed piping system by means of compressed air or other non-inert gas pressure shall not be permitted.

2) A non-inert gas pressure is permitted to be used in a closed piping system referred to in Sentence (1) provided

- a) it is the vapour or gas of the *flammable liquid* or *combustible liquid* being transferred, or
- b) it is a vapour or gas that will not support combustion reaction and is non-reactive with the *flammable liquid* or *combustible liquid* being transferred.

## 4.4.11.1.

### 4.4.11. Operating Procedures for Piping Systems

#### 4.4.11.1. Procedures

1) Standard procedures for normal operation and for emergencies shall be given in printed form to all employees engaged in the operation of equipment for the transfer of *flammable liquids* or *combustible liquids* and shall be posted for convenient reference.

#### 4.4.11.2. Training

1) All employees concerned with transfer operations involving *flammable liquids* or *combustible liquids* shall be trained in

- a) the emergency procedures referred to in Article 4.4.11.1.,
- b) the importance of constant attendance during all loading or unloading operations,
- c) extinguishing procedures for fires involving *flammable liquids* and *combustible liquids*, and
- d) the *flammable liquid* and *combustible liquid* colour coding and identification system required in Article 4.4.8.7.

2) Employees engaged in the operation of equipment for the transfer of *flammable liquids* or *combustible liquids* shall be trained in the location, function and operation of valves used for the operation of fire protection equipment and manual emergency shut-off valves.

#### 4.4.11.3. Emergency Valves

1) Signs indicating the location of valves used for the operation of fire protection equipment and manual emergency shut-off valves shall be posted in conspicuous locations.

#### 4.4.11.4. Portable Extinguishers

1) One 80-B:C rated portable extinguisher or two 40-B:C units shall be provided in the vicinity of pumps and ancillary equipment used for the transfer of *flammable liquids* or *combustible liquids*.

#### 4.4.11.5. Visual Inspections

1) A visual inspection routine for the prompt detection of obviously abnormal conditions shall be established and shall be performed at least once each shift.

2) A visual inspection shall be made at least once during each day of operation of all aboveground piping systems, pumps and other ancillary equipment, to detect leakage, and any such leakage shall be repaired as quickly as practicable.

3) Where necessary, flammable vapour indicators shall be used to detect leakage.

4) Open flames and spark-producing devices shall not be used for leakage detection referred to in Sentence (2).

#### 4.4.11.6. Operational Tests

1) To ensure proper operation, monthly inspections and tests shall be made of all safety shut-off valves and other fire safety devices, with particular attention directed to normally open, fusible-link-operated valves, float valves and automatic controls.

2) Records of inspections and tests of equipment referred to in Sentence (1) shall be retained in conformance with Article 1.1.1.2.

#### 4.4.11.7. Maintenance

1) Except as provided in Sentence (6), maintenance shall not be carried out on piping systems while they are under pressure.

2) If connections or piping are to be opened, the system shall be drained of *flammable liquids* and *combustible liquids*.

3) Where equipment for handling *flammable liquids* or *combustible liquids* has to be repaired, it shall be removed and taken to maintenance areas when possible.

4) Tags shall be attached to all valves on piping systems that are shut off for maintenance purposes to indicate that such valves are not to be opened.

5) Piping that has been used for the transfer of *flammable liquids* or *combustible liquids* shall be removed or capped when it is no longer intended to be used.

6) Connections to pressurized piping systems shall be made in conformance with good practice such as described in

- a) API RP 1107, "Recommended Pipeline Maintenance Welding Practices,"
- b) API 2200, "Repairs to Crude Oil, Liquefied Petroleum Gas and Products Pipelines," or
- c) API 2201, "Welding or Hot Tapping on Equipment Containing Flammables."

## Section 4.5. Fuel Dispensing Stations

### 4.5.1. Scope

#### 4.5.1.1. Application

(See Appendix A.)

1) This Section applies to the storage, handling and use of *flammable liquids* and *combustible liquids* at *fuel dispensing stations*.

2) Except as provided in this Section, the storage and dispensing of Class 2.1 flammable gases at *fuel dispensing stations* shall conform to gas regulations made pursuant to the Safety Codes Act. (See Appendix A.)

### 4.5.2. Storage and Handling

#### 4.5.2.1. Outside Aboveground Storage Tanks

1) Except as provided in Sentences (2) and (3), the installation of outside aboveground *storage tanks* at *fuel dispensing stations* shall be in conformance with Subsection 4.3.2.

2) Outside aboveground *storage tanks* used exclusively at *fuel dispensing stations* shall have an individual capacity of not more than 50 000 L, and their aggregate capacity shall not exceed 150 000 L.

3) Outside aboveground *storage tanks* at *fuel dispensing stations* shall be provided with

- physical protection against collision damage,
- measures to prevent unauthorized access to the *storage tank* and its ancillary equipment, and
- measures to contain accidental spillage in conformance with Subsection 4.3.7.

4) The temporary use of moveable *storage tanks* for dispensing *flammable liquids* or *combustible liquids* into the fuel tanks of vehicles or other motorized equipment on premises shall be permitted only when acceptable to the *authority having jurisdiction*.

#### 4.5.2.2. Class I Liquids in Buildings

1) Except as provided in Sentence 4.1.8.4.(2), Class I liquids shall not be stored or handled within a *fuel dispensing station* unless the *building* conforms to Subsection 4.2.9.

2) Class I liquids shall not be stored or handled within any *building* having a *basement*, cellar or pit in which flammable vapours may accumulate. (See Appendix A.)

3) The location of dispensers of Class I liquids within a *building* shall conform to Subsection 3.3.5. of the Alberta Building Code.

#### 4.5.2.3. Storage Tanks in Buildings

1) Where Class IIIA liquids are stored and dispensed inside *buildings* from *storage tanks*, the individual tanks shall have a capacity of not more than 2 500 L and the aggregate capacity of all the tanks shall not exceed 10 000 L.

2) All fill pipes, vent piping and valves associated with the *storage tanks* referred to in Sentence (1)

- shall conform to Subsections 4.3.5. and 4.3.6., and
- shall be permanently marked to indicate the liquid in each tank and the equipment controlled by the valves.

#### 4.5.2.4. Marine Fuel Dispensing Stations

1) Dispensers at *marine fuel dispensing stations* shall be at a location which will permit safe access by watercraft or aircraft.

#### 4.5.2.5. Containers

1) All packaged *flammable liquid* and *combustible liquid* products stored or sold at a *fuel dispensing station* shall be in *closed containers* conforming to Article 4.2.3.1., distinctly marked with the generic name of the liquid they contain.

2) At *fuel dispensing stations*, every container for dispensing *flammable liquids* or *combustible liquids* shall be kept tightly closed when disconnected from its pumping apparatus.

3) Every container referred to in Sentence (2) that is equipped with a pump shall have a vapour-tight connection between the pump and the container.

#### 4.5.2.6. Empty Containers

1) The storage of empty containers which previously contained *flammable liquids* or *combustible liquids* shall conform to Sentences 4.5.2.2.(1) and (2) and 4.5.2.5.(2).

#### 4.5.2.7. Filling of Containers

1) Containers shall not be filled beyond their safe filling level.

### 4.5.3. Dispensing Systems

#### 4.5.3.1. Dispensers

1) Fixed dispensers for *flammable liquids* or *combustible liquids* shall conform to CSA B346-M,

## 4.5.3.2.

"Power-Operated Dispensing Devices for Flammable Liquids."

**2)** Fixed dispensers for *flammable liquids* or *combustible liquids* shall be provided with sumps conforming to ULC/ORD-C107.21, "Under Dispenser Sumps."

### 4.5.3.2. Location

**1)** Fixed dispensers for Class I liquids shall be installed outside *buildings* and not less than

- 3 m from any right-of-way and any property line,
- 3 m from any propane gas dispenser,
- 1.5 m from any natural gas dispenser,
- 6 m horizontally from any fixed source of ignition,
- 3 m from any *building* opening, except those openings in *buildings* for the shelter of operating personnel in which electrical installations conform to Article 4.1.4.1., and
- 6 m from any manhole or sewer opening.

**2)** Fixed dispensers for Class II or IIIA liquids are permitted to be installed inside a *building* when

- the *building* is not open to the public,
- the dispensers are located on the *first storey*,
- drainage is provided in conformance with Subsection 4.1.6., and
- ventilation is provided in conformance with Subsection 4.1.7. of this Code and with the requirements for storage garages in Part 6 of the Alberta Building Code.

### 4.5.3.3. Protection against Collision Damage

**1)** Fixed dispensers shall be protected against collision damage by

- a concrete island not less than 100 mm high, or
- posts or guardrails.

## 4.5.4. Shut-Off Devices

### 4.5.4.1. Location and Identification

**1)** Devices to shut off the power to all dispensers shall be provided at a remote location or shielded from any fire that might occur in the dispensing area.

**2)** The shut-off devices required in Sentence (1) shall be clearly identified and easily accessible.

### 4.5.4.2. Self-Service Outlets

**1)** Except as required in Article 4.5.8.5. and Sentence (2), an emergency shut-off switch to stop

all dispensers at *self-service outlets* shall be located at the central control console described in Sentence 4.5.8.2.(2) so that it is readily accessible to the attendant.

**2)** At card or key activated *self-service outlets*, the emergency shut-off switch required in Sentence (1) shall be in a readily accessible location acceptable to the *authority having jurisdiction*.

**3)** Emergency shutoff switches required by Sentences (1) and (2) shall only have a manual reset capability.

### 4.5.4.3. Marine Fuel Dispensing Stations

**1)** At *marine fuel dispensing stations* a readily accessible valve shall be provided in each pipeline at or within 7.5 m of the pier to shut off the supply from shore.

## 4.5.5. Delivery Hose and Nozzles

### 4.5.5.1. Delivery Hose

**1)** Delivery hose shall conform to CAN/ULC-S612-M, "Hose for Flammable and Combustible Liquids."

**2)** Except as permitted in Sentences (3) and (4), hose through which *flammable liquids* or *combustible liquids* are dispensed at a *fuel dispensing station* shall be restricted to a maximum extended length of 4.5 m.

**3)** Where a retracting mechanism is used, a maximum extended length of 6 m shall be permitted.

**4)** At *marine fuel dispensing stations* or at card or key activated dispensers, the length of extended hose is permitted to exceed the values in Sentences (2) and (3).

### 4.5.5.2. Hose Nozzle Valves

**1)** Every hose nozzle valve through which a Class I or II liquid is dispensed by a motorized dispenser into a vehicle tank shall

- be automatic closing as required in Sentence (2), and
- conform to CAN/ULC-S620-M, "Hose Nozzle Valves for Flammable and Combustible Liquids."

**2)** Except as provided in Sentences (3) to (5), a hose nozzle valve shall be constructed so that the valve

- can be kept open only by the continuous application of manual pressure, or
- is equipped with a hold-open device that is an integral part of the nozzle which will
  - allow automatic dispensing,

- ii) automatically shut off when the vehicle tank is filled, and
- iii) shut off if the nozzle is dropped or falls from the fill pipe.

**3)** A hose nozzle valve at a *marine fuel dispensing station* shall be of the type without a hold-open device, in conformance with Clause (2)(a).

**4)** When a hose nozzle valve with a hold-open device is used at a *fuel dispensing station*, a break-away coupling conforming to CAN/ULC-S644-M, "Emergency Breakaway Fittings for Flammable and Combustible Liquids" shall be provided.

**5)** When the flow of liquid can be stopped other than by the hose nozzle valve, a hose nozzle valve with a hold-open device is permitted to be used only if it is provided with a device that will automatically close the hose nozzle valve upon a drop of pressure in the dispensing hose.

## 4.5.6. Remote Pumping Systems

### 4.5.6.1. Application

**1)** This Subsection shall apply to systems for dispensing *flammable liquids* or *combustible liquids* where such liquids are transferred from bulk storage to individual or multiple dispensers by pumps located elsewhere than at the dispensers.

### 4.5.6.2. Pumps and Control Equipment

**1)** Pumps, including associated control equipment, shall be designed so that the system will not be subject to pressures above the design working pressure.

**2)** Pumps shall be securely anchored and protected against damage from vehicles.

### 4.5.6.3. Emergency Valves

**1)** An emergency valve conforming to CAN/ULC-S651-M, "Emergency Valves for Flammable and Combustible Liquids" shall be installed in the supply line so that the shear point of the valve is at a level not higher than the base of the dispenser nor more than 25 mm below it.

**2)** The emergency valve required in Sentence (1) shall be maintained in operating condition and serviced at intervals not greater than 12 months.

### 4.5.6.4. Pump Location

- 1)** Pumps installed aboveground and outside *buildings* shall be located not less than
- a) 3 m from any property line, and
  - b) 1.5 m from any *building* opening.

**2)** When an outside pump location is impractical, pumps are permitted to be installed inside *buildings* as provided in Article 4.5.2.2. or in pits as provided in Article 4.4.10.3.

### 4.5.6.5. Leakage Testing

**1)** After the completion of the installation, including paving, all underground piping connected to tanks shall be tested for leakage in conformance with Subsection 4.4.6.

### 4.5.6.6. Marine Fuel Dispensing Stations

**1)** Except as permitted in Sentence (2), tanks and pumps not integral with the dispenser at *marine fuel dispensing stations* shall be located on the shore or on a pier of the solid-fill type.

**2)** Where shore locations would result in excessively long supply lines to the dispenser, *storage tanks* are permitted to be installed on a pier provided that

- a) the applicable portions of Subsection 4.3.7. relating to spacing, secondary containment and piping are complied with, and
- b) the quantity stored does not exceed 5 000 L aggregate capacity.

**3)** No *storage tank* at a *marine fuel dispensing station* shall be located closer than 4.5 m horizontally from the normal annual high-water mark.

**4)** *Storage tanks* located on shore and supplying *marine fuel dispensing stations* are permitted to be located aboveground where rock or a high water table make underground tanks impracticable.

**5)** Where *storage tanks* at a *marine fuel dispensing station* are at an elevation above the dispenser, an electrically operated solenoid valve, designed to open only when the dispenser is being operated, and to prevent gravity draining of the tank in the event of a rupture of the supply line to the dispenser, shall be provided at the *storage tank* outlet, positioned adjacent to and outside the valve specified in Article 4.3.6.1.

**6)** Piping between *storage tanks* located on shore and dispensers at a *marine fuel dispensing station* shall conform to Section 4.4., except that where dispensing is from a floating structure, it is permitted to use suitable lengths of flexible hose designed in conformance with good engineering practice between the piping on shore and the piping on the floating structure. (See A-4.7.8.1.(1)(a) in Appendix A.)

## 4.5.7.1.

### 4.5.7. Spill Control

#### 4.5.7.1. Spill Control

1) Areas where *flammable liquids* or *combustible liquids* are dispensed shall be designed to accommodate accidental spillage in conformance with Subsection 4.1.6.

2) Contaminated absorbent materials used during the cleanup of *flammable liquid* and *combustible liquid* spills shall be stored in a *storage tank* or *closed container* conforming to this Part until removed from the premises.

### 4.5.8. Supervision and Dispensing Procedures

#### 4.5.8.1. Attendants

1) Except as provided in Sentence (2) and Article 4.5.8.5., every *fuel dispensing station* shall have at least one attendant on duty when the station is open for business.

2) *Fuel dispensing stations* which do not serve the general public do not require an attendant.

3) Except as permitted at *self-service outlets*, a qualified attendant shall be in constant control of the dispensing of Class I and II liquids into the fuel tanks of motor vehicles or watercraft or into containers.

4) Duties of attendants and fuel dispensing procedures, as stated in Articles 4.5.8.5., 4.5.8.6. and 4.5.8.7., shall be posted at every *fuel dispensing station*.

#### 4.5.8.2. Self-Service Outlets

1) Instructions for the operation of dispensers in *self-service outlets* shall be posted in a conspicuous location.

2) A control console shall be provided at *self-service outlets* within 25 m of all dispensers so that the attendant has an unobstructed view of all units at the same time.

3) The control console referred to in Sentence (2) shall be equipped to regulate the operation of each dispenser.

4) A 2-way communication system between the control console and each pump island shall be provided at *self-service outlets*.

5) At *fuel dispensing stations* which provide both attended service and self-service, the attendant required in Sentence 4.5.8.1.(1) is permitted to dispense *flammable liquids* or *combustible liquids* at the attended service island, provided that

- a) each island has an emergency shut-off switch as described in Article 4.5.4.2., and

- b) the attendant is never more than 25 m from the self-service island or control console.

#### 4.5.8.3. Special Dispensers

1) Except as provided in Article 4.5.8.4. for card or key activated equipment and Article 4.5.8.5. for unattended *self-service outlets*, special dispensers including coin operated, card operated and preset units, shall not be permitted at *self-service outlets* unless there is at least one qualified attendant on duty for each 12 hoses which can be operated simultaneously while the outlet is open to the public.

#### 4.5.8.4. Card or Key Activated Dispensers

1) Card or key activated dispensers are permitted at unattended *self-service outlets* and *fuel dispensing stations* that are not open to the general public, in conformance with Sentences (2) to (6). (See Appendix A.)

2) Except as provided in Sentences (3) to (6), installation of card or key activated dispensers shall conform to the requirements for *self-service outlets* and *fuel dispensing stations* in this Section.

3) Access to card or key activated dispensers shall be restricted to persons authorized by the supply agent to possess a card or key to operate the dispensers.

4) Clearly legible operating instructions, visible at all times, shall be posted at every dispenser island.

5) A telephone or other clearly identified means to notify the fire department shall be provided in a location readily accessible to the user.

6) Emergency instructions, including the telephone number for the local fire department, shall be conspicuously posted to advise the user, in the event of a spill or accident,

- a) to use the emergency shut-off switch required in Article 4.5.4.2., and
- b) to call the fire department.

#### 4.5.8.5. Unattended Self-Service Outlets

1) *Self-service outlets* are permitted to operate as unattended *self-service outlets* in conformance with all relevant sections of this Part and Sentences (2), (3) and (4),

2) An unattended *self-service outlet* shall be provided with the following safety features:

- a) a video recording surveillance system connected to a monitoring facility (see Appendix A),
- b) a manually activated emergency shut-off switch that

- i) shall deactivate power to the individual dispensing unit, and
- ii) can be activated from both sides of the dispensing unit,
- c) a readily accessible manually activated master emergency shut-off switch that
  - i) is located more than 6 m but less than 10 m from the dispensing island, and
  - ii) shall deactivate power to all dispensing units at the station,
- d) dispensing devices which can only be reactivated by trained personnel in attendance at the site in the event an emergency shut-off switch has been activated,
- e) a public pay telephone or other means of direct communication with the fire department shall be provided in a location acceptable to the *authority having jurisdiction*,
- f) an audible alarm activated by the emergency shut-off switches which can be heard throughout the site,
- g) a strobe light activated by an emergency shut-off switch in Clause (b) or (c) in a visible location,
- h) dispensing pump cabinets and panels monitored with intrusion alarm devices connected to a monitoring facility,
- i) pump control and accessory *buildings* that are protected with intrusion alarm devices and smoke and heat detection devices connected to the monitoring facility in Clause (a), and
- j) electronic *storage tank* monitoring for inventory control.

**3)** Dispensing units at an unattended *self-service outlet* shall be such that the maximum quantity of *flammable liquids* and *combustible liquids* dispensed at one time is 100 L, after which

- a) the dispensing unit will automatically shut down, and
- b) further dispensing will not occur until the dispensing unit has been reset and the customer has initiated the starting sequence.

**4)** In addition to the requirements of Articles 4.5.8.7. to 4.5.8.9., an unattended *self-service outlet* shall have weather-resistant signs acceptable to the *authority having jurisdiction* conspicuously posted in the dispensing area indicating

- a) the location and use of the dispenser emergency shut-off switch,
- b) the location and use of the master emergency shut-off switch,
- c) the user must stay outside of their vehicle in view of the fuelling nozzle during dispensing, and

- d) emergency instructions and telephone numbers for the fire department in the event of an accident or spill.

#### 4.5.8.6. Duties of Attendants

**1)** Attendants on duty at *fuel dispensing stations* shall

- a) supervise the dispensing of *flammable liquids* and *combustible liquids*,
- b) activate the controls to permit the dispensing of fuel at an individual dispenser only after the customer at the unit is ready to activate the nozzle,
- c) prevent the dispensing of *flammable liquids* and *combustible liquids* into containers not conforming to Article 4.2.3.1.,
- d) take appropriate measures to prevent sources of ignition from creating a hazard at the dispensers,
- e) take appropriate action in the event of a spill to reduce the risk of fire,
- f) shut off the power to all dispensers in the event of a spill or fire,
- g) prohibit the dispensing of *flammable liquids* or *combustible liquids* into portable containers or portable fuel tanks until they have been removed from vehicles, watercraft or aircraft,
- h) notify the fire department forthwith in accordance with Article 4.3.16.2., when a spill or accident occurs that involves *flammable liquids* or *combustible liquids*, and
- i) be properly trained in
  - i) inventory reconciliation practices,
  - ii) proper and safe product transfer procedures, and
  - iii) pertinent knowledge and responsibilities identified in this Code.

**2)** In addition to the requirements in Sentence (1), attendants on duty at *marine fuel dispensing stations* shall

- a) activate the controls to permit the dispensing of fuel at an individual dispenser only after all ports and hatches on the watercraft have been closed, and
- b) ensure that containers for *flammable liquids* and *combustible liquids*,
  - i) are not filled beyond their safe filling level, and are filled only after they have been removed from the watercraft.

#### 4.5.8.7. Fuel Dispensing Procedures

**1)** Except as provided in Sentence (2), *flammable liquids* and *combustible liquids* shall not be dispensed into the fuel tank of a motor vehicle, watercraft or aircraft while its engine is running.

## 4.5.8.8.

2) It is permitted to dispense a Class II or IIIA liquid into the fuel tank of a motor vehicle while its engine is running provided it is dispensed not less than 6 m away from any Class I liquid dispenser. (See Appendix A.)

3) Class I and II liquids shall not be dispensed at a *fuel dispensing station* into the fuel tank of a motor vehicle while any part of the motor vehicle or any vehicle attached to it is on a *street*.

4) Every person dispensing *flammable liquids* and *combustible liquids* shall

- a) be at least 16 years of age,
- b) take precautions to prevent overflow or spillage of the liquid being dispensed,
- c) not knowingly overfill the fuel system,
- d) subject to Article 4.5.8.6., in the event of spillage immediately apply an absorbent material to soak up the spillage in conformance with Article 4.1.6.3.,
- e) not dispense Class I or II liquids in proximity to open sources of ignition, and
- f) not use any object or device that is not an integral part of the hose nozzle valve assembly to maintain the flow of fuel.

### 4.5.8.8. Sources of Ignition

1) Smoking and non-fixed sources of ignition shall not be permitted within 7.5 m of a dispenser at a *fuel dispensing station*.

### 4.5.8.9. Signs

1) At least one weather-resistant sign conforming to Sentences (2) to (4) shall be provided for each dispenser in a location visible to every driver approaching the dispenser.

2) The sign required in Sentence (1) shall indicate that smoking is not permitted in the vicinity of the dispenser and that the ignition must be turned off while the vehicle is being refuelled. (See Appendix A.)

- 3) The sign required in Sentence (1) shall
- a) have a minimum dimension of 200 mm, and
  - b) except as permitted in Sentence (4), have letters not less than 25 mm high.

4) The sign required in Sentence (1) is permitted to incorporate the international "No Smoking – Ignition Off" symbol not less than 100 mm in diameter.

### 4.5.9. Leakage Detection

#### 4.5.9.1. Liquid Level Measurement

1) The liquid level in *storage tanks* at *fuel dispensing stations* shall be measured and recorded in conformance with Subsection 4.3.16. (see

Article 4.3.15.1. for leakage testing) and a copy of the record kept on site for examination by the *authority having jurisdiction*.

### 4.5.10. Fire Prevention and Protection

#### 4.5.10.1. Portable Extinguishers

1) At least 2 portable extinguishers, each having a rating of not less than 40-B:C, shall be provided at every *fuel dispensing station* in conformance with Part 6.

2) Individual extinguishers required in Sentence (1) shall not weigh in excess of 4.5 kg.

#### 4.5.10.2. Absorbent Materials

1) Absorbent material to soak up liquid spillage shall be provided for use by attendants at *fuel dispensing stations* in conformance with Article 4.1.6.3.

### 4.5.11. Inspection and Maintenance

#### 4.5.11.1. Inspection

1) Operators of *self-service outlets, fuel dispensing stations* and *marine fuel dispensing stations* shall ensure that a weekly inspection is conducted of

- a) dispensing unit hoses and nozzles to ensure safe operation,
- b) dispensing unit pumps and fittings to determine if there are any leaks,
- c) fill boxes and fill pipe areas for product spillage, and
- d) *storage tank* vents to ensure piping or openings are not blocked or damaged.

2) Operators of *self-service outlets, fuel dispensing stations* and *marine fuel dispensing stations* shall ensure that electronic liquid measuring or leak detection equipment is inspected each business day to confirm that the equipment is functioning as intended.

#### 4.5.11.2. Maintenance

1) Operators of *self-service outlets, fuel dispensing stations* and *marine fuel dispensing stations* shall inspect and maintain the *cathodic protection* systems on underground storage tanks and piping in conformance with

- a) CAN/ULC-S603.1, "Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids," for sacrificial anode systems, or
- b) PACE Report 87-1, "Impressed Current Method of Cathodic Protection of Underground Storage Tanks," Clause

5.5(c) and Part 6.0 for impressed current systems.

2) Impressed current *cathodic protection* systems shall be supplied with electrical power on a continuous basis and the power supply shall be inspected at least weekly.

#### 4.5.11.3. Corrective Action

1) The operator of a *self-service outlet*, a *fuel dispensing station* or a *marine fuel dispensing station* shall ensure that immediate corrective action is taken when a condition is identified that contravenes a provision of Sentences 4.5.11.1.(1) and (2).

#### 4.5.11.4. Records

1) Records acceptable to the *authority having jurisdiction* of maintenance and inspections required by Articles 4.5.11.1. and 4.5.11.2. shall be kept in conformance with Article 1.1.1.2.

## Section 4.6. Bulk Plants

### 4.6.1. Scope

#### 4.6.1.1. Application

1) This Section shall apply to that portion of a property where *flammable liquids* or *combustible liquids* are received in bulk quantities and are stored or handled for the purpose of being distributed.

### 4.6.2. Storage

#### 4.6.2.1. Storage

1) *Flammable liquids* and *combustible liquids* shall be stored in

- closed containers* in conformance with Article 4.6.2.4., or
- storage tanks* located outside *buildings* in conformance with Section 4.3.

#### 4.6.2.2. Storage Tanks

1) At bulk plant rail loading and unloading facilities, the minimum distance from a *storage tank* to a railway line shall be in conformance with General Order No. O-32, "Flammable Liquids Bulk Storage Regulations" of Transport Canada.

#### 4.6.2.3. Shock Pressure

1) Bulk *storage tanks*, piping, pumps, valves and associated components shall be designed, installed and maintained to accommodate shock pressure on the system.

#### 4.6.2.4. Container Storage

1) Containers for *flammable liquids* or *combustible liquids* stored indoors shall be arranged in conformance with Subsection 4.2.7.

2) Containers for *flammable liquids* or *combustible liquids* stored outdoors shall be stored in conformance with Subsection 4.2.11., except that the distance between the piles and property lines and the distance between piles need not apply when the containers are stored in an area that does not present a hazard to neighbouring property.

#### 4.6.2.5. Spill Control

1) An outdoor storage area shall be designed to accommodate accidental spillage in conformance with Subsection 4.1.6.

#### 4.6.2.6. Fencing

1) The outdoor area occupied by aboveground *storage tanks*, container storage, ancillary equipment and unloading facilities shall be fenced in conformance with Article 3.3.2.6.

### 4.6.3. Dispensing

#### 4.6.3.1. Interconnection

1) Dispensing systems for Class I liquids shall not be interconnected with dispensing systems for Class II and IIIA liquids.

#### 4.6.3.2. Dispensing into Vehicles

1) Dispensers serving the general public for dispensing Class I liquids into fuel tanks of vehicles, portable tanks, and containers shall not be located at a bulk plant unless separated by a fence or equivalent barrier from the area in which the bulk storage operations are conducted.

2) Where a dispenser referred to in Sentence (1) is supplied from an aboveground *storage tank*

- an electrically-operated solenoid valve, designed to open only when the dispenser is being operated, shall be provided at the tank outlet, and
- an emergency valve shall be provided for the dispenser in conformance with Sentence 4.5.6.3.(1).

3) Dispensing of *flammable liquids* and *combustible liquids* at bulk plants shall be in conformance with Subsection 4.5.8. of this Part.

#### 4.6.3.3. Dispensing and Transfer inside Buildings

1) Class I liquids shall be dispensed or transferred inside *buildings* only in conformance with Subsections 4.1.7. and 4.1.8.

## 4.6.3.4.

### 4.6.3.4. Dispensing into Metal Containers or Tanks

1) Class I liquids shall not be dispensed into a metal container or *storage tank* unless it is electrically connected in conformance with Article 4.1.8.2.

### 4.6.4. Loading and Unloading Facilities

(See Appendix A.)

#### 4.6.4.1. Clearances

1) At a loading or unloading facility for *tank vehicles* or tank cars, the horizontal distance from the fill stem to an aboveground *storage tank*, a *building* or a property line shall be not less than

- a) 7.5 m for Class I liquids, and
- b) 4.5 m for Class II and IIIA liquids.

2) At bulk plant rail loading and unloading facilities, the minimum distance from a loading structure to a railway line shall be in conformance with General Order No. O-32, "Flammable Liquids Bulk Storage Regulations" of Transport Canada.

3) *Buildings* for the shelter of personnel or pumps shall be considered a part of the loading or unloading facility.

#### 4.6.4.2. Multi-Purpose Facilities

1) When piping and pumping systems have been used for the transfer of either *flammable liquids* or *combustible liquids* at loading or unloading facilities, the system shall be cleaned of vapours before the other class of liquid is introduced.

#### 4.6.4.3. Check Valves

1) Systems through which tank cars or *tank vehicles* discharge into aboveground *storage tanks* by means of pumps shall be provided with check valves conforming to Subsection 4.4.8.

2) Systems referred to in Sentence (1) shall be designed, installed and maintained to prevent leakage or spillage.

#### 4.6.4.4. Control Valves

1) Valves installed to control the filling of *tank vehicles* shall be of the self-closing type when used for Class I or II liquids.

2) Control valves referred to in Sentence (1) shall be held open manually, except where automatic devices are provided for shutting off the flow when the vehicle is full or filled to a preset amount.

#### 4.6.4.5. Bonding and Grounding

1) Bonding, grounding and isolation components for protection against static charges

during the loading of *tank vehicles* or tank cars shall be provided when transferring *flammable liquids* or *combustible liquids*.

2) Where *flammable liquids* or *combustible liquids* are transferred into railway tank cars, railway tracks shall be bonded throughout their length and permanently grounded in conformance with CTC 1982-8 RAIL, "Railway Prevention of Electric Sparks Regulations" of Transport Canada.

3) Bonding required in Sentence (1) shall consist of a metallic bond wire connected to the fill stem or to some part of the loading structure in electrical contact with the fill stem in conformance with Subsection 4.1.4.

4) Bonding wires for *tank vehicles* shall be provided with a pull-off connector attached so as to be in electrical contact with the cargo tank of the *tank vehicle*.

5) The bonding connection required in Sentence (1) shall be fixed to the *tank vehicle* or *storage tank* before dome covers are raised and shall remain in place until filling is completed and all dome covers have been closed and secured.

#### 4.6.4.6. Downspouts

1) Filling of *tank vehicles* or tank cars through open domes shall be in conformance with Sentence 4.1.8.2.(2).

#### 4.6.4.7. Identification

1) Areas used for the transfer of *flammable liquids* or *combustible liquids* shall be clearly designated as such by posted placards conforming to the "Transportation of Dangerous Goods Act" and its Regulations.

### 4.6.5. Fire Protection

#### 4.6.5.1. Portable Extinguishers

1) At least 2 portable extinguishers, each having a rating of not less than 40-B:C, shall be provided at hazardous locations in bulk storage plants for *flammable liquids* and *combustible liquids*, except that such portable extinguishers are permitted to be provided from the *tank vehicles* operated as part of a bulk plant which is not required in Article 4.6.2.6. to be fenced.

### 4.6.6. Spill Control

#### 4.6.6.1. Spill Control

1) Facilities to control possible spills of *flammable liquids* or *combustible liquids* shall be provided at loading and unloading points in conformance with Subsection 4.1.6.

## Section 4.7. Piers and Wharves

### 4.7.1. Scope

#### 4.7.1.1. Application

1) This Section applies to *flammable liquid* and *combustible liquid* installations on piers and wharves, but does not include *marine fuel dispensing stations*.

### 4.7.2. General

#### 4.7.2.1. Clearances

1) Piers and wharves at which *flammable liquid* or *combustible liquid* cargoes are to be transferred in bulk quantities to or from marine tank vessels shall be not less than 30 m from

- a) any bridge over a navigable waterway, and
- b) an entrance to a superstructure of any vehicular or railroad tunnel under a waterway.

2) The termination of fixed piping for loading and unloading *flammable liquids* or *combustible liquids* shall be not less than 60 m from a bridge or from an entrance to a tunnel.

#### 4.7.2.2. Construction

1) The substructure and deck of a pier or wharf shall be designed for its intended use and shall be constructed of heavy timber or material that will provide adequate flexibility, resistance to shock, durability, strength and fire resistance.

### 4.7.3. Storage Tanks

#### 4.7.3.1. Installation

1) Except as permitted in Sentences (2) and (3), *storage tanks* shall be installed on shore in conformance with Subsections 4.3.2. to 4.3.7.

2) *Storage tanks* are permitted to be located in *buildings* on piers and wharves of solid-fill or *noncombustible construction* provided they conform to Subsections 4.3.12. to 4.3.14.

3) *Storage tanks* are permitted to be buried in piers and wharves of the solid-fill type provided they conform to Subsections 4.3.8. to 4.3.11.

### 4.7.4. Piping, Valves and Fittings

#### 4.7.4.1. Installation and Materials

1) The method of installation and materials used for piping, valves and fittings shall conform to Section 4.4.

#### 4.7.4.2. Pipe Supports

1) Piping shall be properly supported and arranged to prevent excessive vibration or strain on equipment connected to it.

- 2) Piping supports shall consist of
  - a) wood having no dimension less than 150 mm,
  - b) steel, or
  - c) concrete.

3) Where pipe is supported more than 1.2 m above the pier deck, piping supports shall have a minimum *fire-resistance rating* of 2 h.

#### 4.7.4.3. Guards

1) In areas where general cargo is handled or where piping might be subject to mechanical damage from vehicles or watercraft, the piping shall be protected by means of guards.

#### 4.7.4.4. Flexible Connections

1) Piping between the shore and piers or wharves shall be provided with swing joints or flexible connections designed in conformance with good engineering practice to permit the independent movement of the pier or wharf and shore piping without strain on the pipe.

#### 4.7.4.5. Shut-Off Valves

1) A readily accessible valve to shut off the supply from shore shall be provided in each pipeline within 7.5 m of piers and wharves.

#### 4.7.4.6. Access Openings for Inspection

1) Access openings for inspection purposes below deck shall be provided for valves required in Article 4.7.4.5. and for connections to pipelines, and suitable signs shall be posted indicating their locations.

2) No freight or materials shall be placed on piers and wharves in such a manner as to obstruct the access openings required in Sentence (1).

#### 4.7.4.7. Identification

1) Identification tags or labels of metal or other material impervious to water and to the *flammable liquids* or *combustible liquids* being transferred shall be attached to and maintained on all pipelines and control valves to designate their use.

#### 4.7.4.8. Leakage Testing

1) Piping systems shall be tested for leakage in conformance with Subsection 4.4.6. before being put into service and before reactivation when used on a seasonal basis.

## 4.7.5.1.

2) Underground piping systems referred to in Sentence (1) shall be tested at intervals no greater than 12 months.

### 4.7.5. Bonding and Grounding

#### 4.7.5.1. Bonding and Grounding

1) Railway tracks on piers and wharves shall be bonded throughout their length and permanently grounded in conformance with CTC 1982-8 RAIL, "Railway Prevention of Electric Sparks Regulations" of Transport Canada.

2) Insulating joints shall be placed in all rails where entering upon the pier or wharf.

### 4.7.6. Fire Protection

#### 4.7.6.1. Portable Extinguishers

1) Portable extinguishers having a rated capacity of 40-B:C shall be provided in the vicinity of Class I liquid pumps and fuel dispensers in conformance with Part 6.

2) Portable extinguishers shall be kept in the pump house or other suitable location where they will be accessible in the event of an emergency, but not accessible to the public.

3) Where vessels are loading or unloading *flammable liquids* or *combustible liquids* or are being refuelled, portable extinguishers with a rating of not less than 40-B:C shall be placed on the pier or wharf in the vicinity of loading or unloading operations, so that they will be accessible in the event of a fire emergency.

4) Portable extinguishers provided in conformance with Sentence (3) shall be in addition to those provided on board the vessels.

#### 4.7.6.2. Training

1) Operating personnel shall be trained in how to summon the nearest fire department in the event of fire.

### 4.7.7. Bulk Transfer Stations

#### 4.7.7.1. Location

1) Except as permitted in Sentence (2), the bulk transfer of *flammable liquids* or *combustible liquids* shall be permitted only on piers and wharves used exclusively for that purpose.

2) Where it is not practicable to locate bulk transfer stations on separate piers and wharves, such stations are permitted to be located on general purpose piers and wharves provided that guards or fences are installed around valves or pumping

equipment to prevent entry of unauthorized personnel.

#### 4.7.7.2. Leakage and Spill Control

1) Measures to accommodate possible leakage or spillage from hose couplings shall be provided in conformance with Subsection 4.1.6.

2) Provision shall be made to prevent spillage resulting from the disconnection of hoses.

#### 4.7.7.3. Hose Connections

1) Except as provided in Sentence (2), hose connections on piping shall be of the bolted flange type, and all such connections shall be provided with shut-off valves.

2) The use of cam-locking connections up to 100 mm in size shall be permitted.

3) Hose connections shall not project beyond the face of piers and wharves.

### 4.7.8. Cargo Hose

#### 4.7.8.1. Cargo Hose

1) The transfer of *flammable liquids* or *combustible liquids* between tank vessels and piers or wharves shall be through

- a) flexible cargo hose designed in conformance with good engineering practice (see Appendix A), or
- b) jointed tubing or piping
  - i) suitable for the cargo to be transferred, and
  - ii) designed to withstand the maximum design working pressure.

#### 4.7.8.2. Maintenance and Testing

1) Cargo hose shall be maintained in satisfactory operating condition and be pressure tested, at intervals not greater than 12 months, to 1.5 times the maximum working pressure but not less than 350 kPa (gauge).

#### 4.7.8.3. Supports

1) Cargo hose shall be supported where it is not run on a solid foundation.

### 4.7.9. Cargo Pumps

#### 4.7.9.1. Design and Installation

1) Cargo pumps shall be designed and installed in conformance with Subsection 4.4.10.

#### 4.7.9.2. Pressure Relief

1) Cargo pumps capable of producing pressures in excess of the safe working pressure of

the cargo hose shall be provided with pressure relief devices such as return lines or relief valves.

#### 4.7.9.3. Location

- 1) Except as permitted in Sentence (2), cargo pumps shall be located
  - a) on shore or on piers and wharves either of *noncombustible construction* or of the solid-fill type, and
  - b) not less than 3 m from other *buildings* or structures.
- 2) Where it is not practicable to install cargo pumps as required in Sentence (1), they are permitted to be installed on piers and wharves of *combustible construction* if located in pump houses
  - a) conforming to Subsection 4.7.10., and
  - b) located not less than 3 m from other *buildings*.

#### 4.7.10. Pump Houses

##### 4.7.10.1. Construction

- 1) Pump houses shall be of *noncombustible construction* with floors that are chemically resistant to the liquid being handled, liquid-tight and equipped with curbs or flashings around the base of the wall not less than 100 mm in height to contain any spilled liquid.

##### 4.7.10.2. Ventilation

- 1) Ventilation shall be provided in pump houses in conformance with Subsection 4.1.7.

#### 4.7.11. Transfer Operations

##### 4.7.11.1. Supervision

- 1) Transfer operations shall be carried out only under the continuous supervision of a person qualified to supervise such operations.
- 2) Cargo shall not be transferred to or from a marine tank vessel unless sufficient personnel are on board to control the operation.
- 3) The person responsible for directing the operations shall
  - a) prior to transfer of cargo, ascertain that no unauthorized repair work is being carried out on the pier or wharf and that there are no open flames in the vicinity,
  - b) during the transfer of cargo, monitor the progress of the loading and unloading to prevent overflow, and
  - c) inspect the hose and connections for leakage and, if leakage occurs, stop the operations.

#### 4.7.11.2. Bonding and Grounding

- 1) Tank vessels shall be electrically connected to the shore piping prior to the connecting of cargo hose, except when *cathodic protection* facilities are operating.
- 2) Electrical connections to tank vessels shall be maintained until the cargo hose has been disconnected and any spillage has been removed.

#### 4.7.11.3. Equipment

- 1) The cargo hose shall be of adequate length to allow for the movement of the vessel.
- 2) Gaskets shall be used in all hose joints and pipe couplings to prevent leakage.
- 3) Flanged joints shall be tightly bolted to prevent leakage.
- 4) Drip pans shall be placed under hose connections on piers and wharves, except where a sump pit or settling basin is provided.

#### 4.7.11.4. Spill Control

- 1) When transfer operations are completed,
  - a) the valves on the hose connections shall be closed, and
  - b) the cargo hose shall be drained into appropriate containers that shall be emptied in conformance with Subsection 4.1.6.
- 2) Care shall be taken that no liquid is discharged on a pier or wharf or overboard during draining and emptying operations.

## Section 4.8. Process Plants

### 4.8.1. Scope

#### 4.8.1.1. Application

- 1) Except as provided in Sentence (2), this Section applies to those *process plants*, including *refineries*, which contain industrial processes involving *flammable liquids* or *combustible liquids*.
- 2) This Section does not apply to *distilleries*.

### 4.8.2. Outdoor Processing Equipment

#### 4.8.2.1. Location

- 1) The location of outdoor processing equipment in *process plants* shall be based on its

### 4.8.3.1.

*flammable liquid* or *combustible liquid* capacity as described in Sentences (2) to (4).

**2)** Except as provided in Sentence (4), outdoor processing equipment having emergency relief venting and a working pressure of not more than 17 kPa (gauge) shall be separated from property lines and *buildings* on the same property by distances

- a) equal to those in Table 4.3.2.1. for stable liquids, and
- b) 2.5 times those in Table 4.3.2.1. for *unstable liquids*.

**3)** Except as provided in Sentence (4), outdoor processing equipment having emergency relief venting and a working pressure more than 17 kPa (gauge) shall be separated from property lines and *buildings* on the same property by distances

- a) 1.5 times those in Table 4.3.2.1. for stable liquids, and
- b) 4 times those in Table 4.3.2.1. for *unstable liquids*.

**4)** Where protection is not provided against fires or explosions in processing equipment, the distances in Sentences (2) and (3) shall be doubled. (See Sentence 4.3.2.5.(2).)

### 4.8.3. Processing Buildings

#### 4.8.3.1. Construction

**1)** Except as provided in Article 1.1.2.3., *buildings* containing processing equipment involving *flammable liquids* or *combustible liquids* shall be constructed in conformance with the Alberta Building Code.

#### 4.8.3.2. Explosion Venting

**1)** Except as provided in Article 4.8.4.2., where Class IA liquids or *unstable liquids* are processed within a room or a *building*, the room or *building* shall be designed to prevent critical structural and mechanical damage from an internal explosion in conformance with good engineering practice such as described in NFPA 68, "Venting of Deflagrations." (See A-3.2.8.2.(1)(d) in Appendix A.)

#### 4.8.3.3. Fire Separations

**1)** Areas where *unstable liquids* are handled or where small scale unit chemical processes are carried on shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* of not less than 2 h.

#### 4.8.3.4. Basements and Pits

**1)** *Buildings* where Class I and II liquids are handled in chemical processes shall not have *basements* or covered pits.

#### 4.8.3.5. Ventilation

**1)** Enclosed processing *buildings* handling *flammable liquids* or *combustible liquids* shall be ventilated as specified in Subsection 4.1.7.

**2)** Equipment used in a *building* and the ventilation of the *building* shall be designed so as to limit flammable vapour-air mixtures under normal operating conditions to the interior of equipment, and to not more than 1.5 m from such equipment. (See Appendix A.)

### 4.8.4. Fire Prevention and Protection

#### 4.8.4.1. Spill and Vapour Control

**1)** Processing equipment shall be designed and arranged to

- a) prevent the unintentional escape of liquids and vapours, and
- b) minimize the quantity escaping in the event of accidental release.

**2)** Measures to control spilled *flammable liquids* and *combustible liquids* shall be provided in conformance with Subsection 4.1.6.

#### 4.8.4.2. Explosion Protection

**1)** Processing equipment where an explosion hazard is present shall be

- a) designed to withstand the explosion pressure without damage to the equipment,
- b) provided with explosion venting in conformance with NFPA 68, "Venting of Deflagrations," or
- c) provided with an explosion prevention system in conformance with NFPA 69, "Explosion Prevention Systems."

#### 4.8.4.3. Fire Protection

**1)** Where the process warrants such protection, industrial *process plants* shall be supplied with

- a) water supplies with pressure and quantity adequate to meet the probable fire demands,
- b) hydrants,
- c) hoses connected to a permanent water supply and located so that all equipment containing *flammable liquids* or *combustible liquids*, including pumps, can be reached with at least one hose stream,
- d) nozzles capable of discharging a water spray, and
- e) automatic fire suppression systems conforming to Part 6.

**4.8.4.4. Emergency Procedures**

1) Emergency procedures conforming to Article 4.1.5.6. shall be established for *refineries* and *process plants*.

**Section 4.9. Distilleries****4.9.1. Scope****4.9.1.1. Application**

1) This Section applies only to those areas or *buildings* in *distilleries* where *distilled beverage alcohols* are concentrated, blended, mixed, stored or packaged. (See Appendix A.)

2) The storage, handling and use of *flammable liquids* or *combustible liquids* other than *distilled beverage alcohols* in a *distillery* shall conform to Part 4 of this Code.

3) Where there is a conflict between the requirements of this Section and other requirements in Part 4, this Section shall govern.

**4.9.2. General****4.9.2.1. Building Classification**

1) Except as provided in Sentence (2), *buildings* or parts of *buildings* in which *distilled beverage alcohol* is distilled, processed or stored in bulk shall be classified as *high hazard industrial occupancies*.

2) *Buildings* or parts of *buildings* used for storage of *closed containers* of *distilled beverage alcohols* shall be classified as *medium hazard industrial occupancies*.

**4.9.3. Storage Tanks and Containers****4.9.3.1. Design, Fabrication and Testing**

1) *Storage tanks*, wooden vats, barrels, drums or containers used for the storage or processing of *distilled beverage alcohols* shall be designed, fabricated and tested for the anticipated maximum working pressure, operating temperature, internal corrosion conditions and structural stresses to which they could be subjected.

**4.9.3.2. Supports, Foundations and Anchorage**  
(See Appendix A.)

1) Supports, foundations and anchorage of *storage tanks* shall comply with Subsection 4.3.3., except that timber supports shall be permitted.

2) *Storage tank* supports having less than a 2 h *fire-resistance rating* shall be protected by an

automatic fire suppression system conforming to Part 6.

3) The area underneath any *storage tank* greater than 1.2 m in diameter shall be protected by an automatic fire suppression system conforming to Part 6.

**4.9.3.3. Storage Tank Vents**

1) Normal and emergency vents shall be provided on *storage tanks* in conformance with good engineering practice. (See Appendix A.)

**4.9.4. Storage****4.9.4.1. Storage Tanks, Drums and Barrels**

1) Where more than 25 000 L of *distilled beverage alcohol* in *storage tanks*, drums or barrels are stored inside *buildings*, such *buildings* shall be *sprinklered* in conformance with Article 6.5.1.1.

**4.9.4.2. Closed Containers and Storage Aids**

1) Storage of *closed containers* of *distilled beverage alcohols*, packaging materials and empty bottles, drums, barrels and pallets shall be in conformance with Part 3.

**4.9.5. Piping and Pumping Systems****4.9.5.1. Design and Installation**

1) The design, fabrication, assembly and inspection of piping and pumping systems containing *distilled beverage alcohols* shall be suitable for the anticipated maximum working pressures, operating temperatures, internal corrosion conditions and structural stresses to which they could be subjected. (See Appendix A.)

**4.9.6. Ventilation****4.9.6.1. Ventilation**

1) Natural or mechanical ventilation shall be provided for all areas where alcohol vapours are released from *storage tanks* or process equipment under normal operating conditions, to prevent the concentration of vapours from exceeding 25% of the *lower explosive limit*, measured 1.5 m from any equipment or from any opening subject to vapour release.

## 4.9.7.1.

### 4.9.7. Spill Control

#### 4.9.7.1. Spill Control

1) Except as permitted in Sentence (2), emergency drainage systems shall be provided to direct any spills or leakage of *flammable liquids* or *combustible liquids*, together with water used for fire fighting, to a safe location in conformance with Subsection 4.1.6.

2) Water miscible effluent from spills and fire fighting operations is permitted to be directed into a sewer system provided it does not create a fire hazard nor any risk to public health or safety.

### 4.9.8. Fire Protection

#### 4.9.8.1. Portable Extinguishers

1) Except as provided in Sentences (2) to (4), portable extinguishers shall be provided in conformance with Part 6.

2) Except as permitted in Sentence (3), in maturing warehouses, at least one 4-A:30-B:C rated fire extinguisher shall be located adjacent to each *exit*.

3) Hose stations complying with Article 6.2.3.4. are permitted to be installed in lieu of portable extinguishers at locations required in Sentence (2), and spaced so that the travel distance to the nearest hose is not greater than 25 m.

4) At least one 10-B:C portable extinguisher shall be located on each industrial lift truck.

#### 4.9.8.2. Standpipe and Hose Systems

1) Except as provided in Sentence (2), standpipe and hose systems shall be provided and installed in *distilleries* in conformance with Article 2.1.3.1.

2) Where a *building* is *sprinklered* in conformance with Article 6.5.1.1., small hose (38 mm) stations are permitted to be supplied from interior sprinkler piping.

## Section 4.10. Withdrawal of Storage Tanks from Service

### 4.10.1. Scope

#### 4.10.1.1. Application

1) This Section applies to the procedures to be followed when *storage tanks* for *flammable liquids* or *combustible liquids* are removed, abandoned or temporarily taken out of service.

### 4.10.2. Rendering Storage Tanks Temporarily Out of Service

#### 4.10.2.1. Underground Storage Tanks

1) When underground *storage tanks* will be out of service for a period not exceeding 180 days

- a) the liquid level in the *storage tank* shall be measured at intervals not greater than one month and a record of such measurements shall be retained for inspection,
- b) fill pipe covers and covers over openings to measure liquid levels, dispensers and power controls shall be kept locked when not in use, and
- c) vent piping shall be kept open.

2) Except as provided in Sentence (3), when underground *storage tanks* will be out of service for a period exceeding 180 days

- a) the *authority having jurisdiction* shall be notified, in writing, as soon as practical,
- b) the *storage tanks*, connected piping and dispensers shall be emptied of Class I liquid,
- c) the *storage tanks*, piping and dispensers shall be refilled with a Class II or IIIA liquid, or not less than 1 kg of dry ice for each 500 L of tank capacity shall be added to the *storage tank*,
- d) measurements of the liquid level of each *storage tank* containing a Class II or IIIA liquid shall be made at intervals not greater than one month, and a record of such measurements shall be retained for inspection, and
- e) fill pipe covers and covers over openings to measure liquid levels, dispensers and power controls shall be locked.

3) Where underground *storage tank* facilities are operated on a seasonal basis,

- a) at the close of each season of operation,
  - i) the liquid level of each *storage tank* shall be measured,
  - ii) a record of such measurements shall be retained for inspection, and
  - iii) all fill pipe covers and covers over openings for measuring liquid levels, dispensers and power controls shall be locked, and
- b) prior to the start of an operating season,
  - i) the liquid level in each *storage tank* shall be measured,
  - ii) the measurements shall be compared with those recorded at the close of the previous season, and
  - iii) when a loss of liquid or water intrusion is apparent, immediate action shall be taken to determine and correct the condition.

4) When an underground *storage tank* is reactivated for the storage of *flammable liquids* or *combustible liquids*, the *authority having jurisdiction* shall be notified.

5) If a *storage tank* has been out of service for more than 12 months, the tank and piping shall be tested for leakage in conformance with Subsections 4.3.15. and 4.4.6.

#### 4.10.2.2. Aboveground Storage Tanks

1) When an aboveground *storage tank* will be out of service for a period not exceeding 180 days, the piping from the tank shall be capped or the valves necessary to achieve similar isolation of the tank shall be closed and securely locked.

2) When out-of-service *storage tanks* referred to in Sentence (1) contain *flammable liquids* or *combustible liquids*, the liquid level in the tank shall be measured and the readings compared at intervals not greater than one month.

3) Where an aboveground *storage tank* will be out of service for a period exceeding 180 days

- all liquid and vapours shall be removed from the *storage tank* and its connected piping, and
- the *storage tank* markings shall clearly indicate that the tank is empty.

#### 4.10.2.3. Corrosion Protection

1) Corrosion protection systems shall be maintained in operating condition when a *storage tank* is temporarily out of service and during seasonal shutdowns.

### 4.10.3. Removal of Underground Storage Tanks

#### 4.10.3.1. Removal

1) Except as permitted in Article 4.10.3.2., when an *underground storage tank system* has no further use or has been out of service for 2 years

- the owner shall notify the *authority having jurisdiction* in writing at least 30 days prior to the removal of an *underground storage tank system*,
- storage tanks* shall have all *flammable liquids* and *combustible liquids* removed from them,
- storage tanks* shall be purged of vapours, and removed from the ground (see Appendix A),
- the associated piping shall be
  - purged of vapours and the ends permanently sealed by capping or plugging, or
  - removed from the ground.

2) If soil surrounding the *storage tanks* described in Sentence (1) is found to be contaminated, the owner shall

- notify the *authority having jurisdiction*,
- when requested, provide a report showing the extent of the site soil contamination, and
- remove, treat or replace the contaminated soil in a manner acceptable to the *authority having jurisdiction*.  
(See A-4.1.6.3.(2) in Appendix A.)

#### 4.10.3.2. Abandonment in Place

1) Where it is impracticable to remove an underground *storage tank*, the *owner* shall apply to the *authority having jurisdiction* for permission to abandon the tank in place.

2) An *owner* who makes application for permission to abandon a *storage tank* in place in accordance with Sentence (1) shall

- describe in the application, the reasons why it is impracticable to remove the *storage tank* and provide other information that supports his application,
- satisfy the *authority having jurisdiction* that the soil under and around the *storage tank* has not been contaminated with petroleum product, and
- provide confirmation that the *owner* of the property is aware of the application and that he is in agreement with the plan to abandon the *storage tank* in place.

3) The *owner* may be granted permission to abandon the *storage tank* in place if the *authority having jurisdiction* is satisfied that the tank is

- located in whole or in part beneath a permanent *building* or other facility making excavation impracticable,
- of a size or type of construction that makes excavation impracticable,
- inaccessible to the heavy equipment necessary for removal of the tank, or
- situated so that removal of the tank would endanger the structural integrity of nearby *buildings* or other facilities.

4) If the *authority having jurisdiction* grants permission to abandon a *storage tank* in place in accordance with Sentence (3), the *owner* shall be notified in writing.

5) Where the *authority having jurisdiction* grants permission in accordance with Sentence (3), the *owner* shall

- purge the *storage tank* of vapours to less than 10 per cent of the *lower explosive limit*,
- check for the presence of vapours using combustible gas detection equipment,

#### 4.10.4.1.

- c) arrange for a certified person to enter the *storage tank* and conduct an internal inspection of the tank for perforations,
- d) notify the *authority having jurisdiction* if the tank is perforated,
- e) conduct additional investigations or take remedial actions in accordance with directions issued by the *authority having jurisdiction*,
- f) remove sludge from the *storage tank* and dispose of it in a manner acceptable to the *authority having jurisdiction*,
- g) make holes along the top of the *storage tank* large enough to permit filling the tank with inert material,
- h) fill the *storage tank* with sand, gravel, concrete or other inert material acceptable to the *authority having jurisdiction*, and
- i) remove associated piping from service in conformance with Clause 4.10.3.1.(1)(d).

6) Where it is considered impracticable to carry out the internal inspection required by Clause (5)(c), the *owner* shall conduct precision leak tests if so directed by the *authority having jurisdiction*.

#### 4.10.4. Disposal and Reuse of Storage Tanks

##### 4.10.4.1. Disposal

1) Where *storage tanks* are to be disposed of, sufficient openings shall be cut in the tanks to render them unfit for further use. (See Appendix A.)

##### 4.10.4.2. Reuse

1) Except as permitted in Sentence (2), a *storage tank* shall not be reused for the storage of *flammable liquids* or *combustible liquids*.

2) A *storage tank* is permitted to be reused for the storage of *flammable liquids* or *combustible liquids* only after having been

- a) refurbished and found to conform to one of the standards in Sentence 4.3.1.2.(1), or
- b) refurbished in conformance with Sentence (3).

3) A steel *storage tank* is permitted to be refurbished in conformance with the following:

- a) CAN4-S601(A), "Shop Refurbishing of Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids,"
- b) CAN4-S603(A), "Refurbishing of Steel Underground Tanks for Flammable and Combustible Liquids," or
- c) CAN4-S630(A), "Shop Refurbishing of Steel Aboveground Vertical Tanks for Flammable and Combustible Liquids."

4) Aboveground *storage tanks* that have been out of service for a period of more than 180 days and are to be returned to service shall, where

possible, be internally inspected and the *authority having jurisdiction* shall be advised of the inspection results and the intention to return the *storage tanks* to service.

##### 4.10.4.3. Riveted Storage Tanks

1) Riveted *storage tanks* shall not be relocated.

### Section 4.11. Tank Vehicles

#### 4.11.1. Scope

##### 4.11.1.1. Application

1) This Section applies to *tank vehicles* when located on a property covered in this Code.

#### 4.11.2. General

##### 4.11.2.1. Portable Extinguishers

1) A *tank vehicle* shall be provided with at least one portable extinguisher having a minimum rating of 20-B:C and conforming to Part 6.

2) When more than one portable extinguisher is provided, each extinguisher shall have a minimum rating of 10-B:C.

3) Portable extinguishers on a *tank vehicle* shall be readily accessible.

##### 4.11.2.2. Hot Works

1) Hot works performed on or in close proximity to a *tank vehicle* shall conform to Section 5.2. and Article 4.11.2.6.

2) No person shall smoke or use open flame within 7.5 m of *tank vehicles* while being loaded, unloaded or repaired.

##### 4.11.2.3. Damaged or Leaking Containers

1) Containers or tanks that leak or that have become damaged shall not be used to transport *flammable liquids* or *combustible liquids*.

##### 4.11.2.4. Parking inside Buildings

1) A *tank vehicle* shall not be parked inside a *building* unless the *building* is specifically designed for that purpose or the cargo tank has been purged in accordance with this Section.

2) Where a *tank vehicle* is parked inside a *building*, provisions shall be made to ensure that there is sufficient space in the tank to compensate for thermal expansion of the *flammable liquid* or *combustible liquid*.

3) Prior to parking a *tank vehicle* inside a *building*, the vehicle shall be inspected to ensure that there are no leaks in the tank, piping or valving.

#### 4.11.2.5. Parking outside Buildings

1) Except as provided in Sentence (2), a *tank vehicle* is permitted to be left unattended by the vehicle operator outside a *building* for not more than 1 h.

2) A *tank vehicle* is permitted to be left unattended by the vehicle operator outside a *building* for more than 1 h, but only in a parking space

- a) that is located not less than 15 m from a *building*, and
- b) where the *tank vehicle* is not exposed to undue hazard from accident or collision.

#### 4.11.2.6. Repair and Servicing

(See Appendix A.)

1) No person shall repair or service the cargo tank of a *tank vehicle* in a *building* unless

- a) all *flammable liquids* and *combustible liquids* have been removed from the cargo tank and stored in a *storage tank* or container constructed and installed in accordance with this Part,
- b) the cargo tank has been purged with steam of flammable vapours or combustible vapours, outside the *building* or in a well ventilated area, to less than 10 per cent of the *lower explosive limit*, and
- c) when the cargo tank is being repaired it is monitored for the presence of flammable vapours and combustible vapours using combustible gas detection equipment.

2) No person shall repair, service or store a *tank vehicle* in a *building* other than for repairs conducted in conformance with Article 4.11.2.2. and Sentence (1), unless

- a) the *building* is acceptable to the *authority having jurisdiction*, or
- b) all *flammable liquids* and *combustible liquids* have been removed from the cargo tank and the tank has been purged of flammable vapours or combustible vapours, outside the *building* or in a well ventilated area, to less than 10 per cent of the *lower explosive limit*.

### 4.11.3. Loading and Unloading

#### 4.11.3.1. Ignition Sources

1) During loading and unloading operations, a *tank vehicle* and its delivery equipment shall be separated from ignition sources by distances conforming to the requirements for dispensers in Articles 4.5.3.2. and 4.5.8.8.

#### 4.11.3.2. Static Electric Charges

1) During loading and unloading of a *tank vehicle*, measures shall be taken against static electric charges in conformance with Articles 4.1.8.2. and 4.6.4.5.

#### 4.11.3.3. Supervision

1) During loading and unloading of a *tank vehicle*, trained personnel shall be in a position to shut off the flow of liquid in an emergency.

#### 4.11.3.4. Multi-Use Compartments

1) When a compartment of a *tank vehicle* has been used to carry a Class I liquid, the compartment, piping and accessory delivery equipment shall be drained of liquid before a Class II or IIIA liquid is loaded.

#### 4.11.3.5. Engine

1) When loading or unloading of Class I liquids is done without the use of the engine of the *tank vehicle*, the engine ignition shall be shut off during the transfer operations.

#### 4.11.3.6. Unloading

1) Before a *tank vehicle* is unloaded, the volume of liquid in the receiving tank shall be measured to ensure that the tank can accept the volume to be unloaded.

2) If tank vents are obstructed, the transfer of liquid shall be stopped.

3) A *tank vehicle* shall not be parked on a *street*, shoulder or sidewalk while unloading at a *fuel dispensing station*.



# Part 5

## Hazardous Processes and Operations

### Section 5.1. General

#### 5.1.1. Scope

##### 5.1.1.1. Application

1) This Part applies to processes and operations that involve a risk from explosion, high flammability or related conditions which create a hazard to life safety.

##### 5.1.1.2. Explosives

1) The manufacturing, handling, transportation, sale and use of explosives, blasting agents, detonators, propellant explosives, pyrotechnics, and ammunition shall be in conformance with the "Explosives Act" (Canada) and its Regulations.

#### 5.1.2. Electrical Installations

##### 5.1.2.1. Hazardous Locations

1) Where wiring or electrical equipment is located in areas in which flammable gases or vapours, *combustible dusts* or *combustible fibres* are present in quantities sufficient to create a hazard, such wiring and electrical equipment shall conform to electrical regulations made pursuant to the Safety Codes Act. (See Appendix A.)

##### 5.1.2.2. General

1) Electrical installations shall conform to electrical regulations made pursuant to the Safety Codes Act.

#### 5.1.3. Ventilation

##### 5.1.3.1. Ventilation

1) Ventilation shall be provided for hazardous locations and processes in conformance with the Alberta Building Code and with this Part.

#### 5.1.4. Flash Point

##### 5.1.4.1. Flash Point

1) The *flash points* of *flammable liquids* and *combustible liquids* shall be determined in conformance with Subsection 4.1.3.

#### 5.1.5. Fire Safety Plan

##### 5.1.5.1. Fire Safety Plan

1) Except as provided in Sentences (2) and (3), a fire safety plan conforming to Section 2.8. shall be prepared for areas where processes and operations described in Article 5.1.1.1. take place.

2) In addition to the information required in Section 2.8., the fire safety plan shall include

- a) the location and identification of storage and use areas for specific products, in conformance with Article 3.2.2.6., and
- b) the names, addresses and telephone numbers of persons to be contacted in case of fire during non-operating hours.

3) In addition to the information required in Sentence (2), where Class 7 radioactive materials are used or handled, the fire safety plan shall include the information specified in Subsection 3.1.2.

4) Personnel shall be instructed in the fire emergency procedures described in the fire safety plan in Sentences (1), (2) and (3) before they are given any responsibility for fire safety.

5) The fire safety plan shall be acceptable to the *authority having jurisdiction* and maintained for the fire department inspection and for reference by on site personnel. (See Appendix A.)

### Section 5.2. Hot Works

#### 5.2.1. General

##### 5.2.1.1. Application

1) This Section shall apply to hot works involving open flames or producing heat or sparks,

## 5.2.1.2.

including, without being limited to, cutting, welding, soldering, brazing, grinding, adhesive bonding, thermal spraying and thawing pipes.

2) Except as provided in this Section, hot works described in Sentence (1) shall conform to CSA W117.2, "Safety in Welding, Cutting, and Allied Processes."

### 5.2.1.2. Training

1) Hot works shall be performed only by personnel trained in the safe use of equipment in conformance with this Section.

## 5.2.2. Hot Work Equipment

### 5.2.2.1. Maintenance

1) Hot work equipment shall be maintained in good operating condition.

### 5.2.2.2. Inspection

1) Hot work equipment shall be examined for leakage or defects prior to each use.

2) Leaks or defects found in hot work equipment shall be repaired prior to use.

### 5.2.2.3. Equipment Not in Use

1) All valves shall be closed and gas lines bled when Class 2 gas hot work equipment is not in use.

2) Electric hot work equipment shall be de-energized when not in use.

### 5.2.2.4. Compressed Gas Equipment

1) The design and installation of oxygen-fuel gas equipment shall conform to NFPA 51, "Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting and Allied Processes."

2) Unalloyed copper piping shall not be used for acetylene gas.

3) Oil or grease shall not be used with equipment for oxygen.

4) Cylinders of Class 2 gases shall conform to Part 3.

## 5.2.3. Prevention of Fires

### 5.2.3.1. Location of Operations

1) Except as provided in Sentence (2), hot work shall be carried out in an area free of combustible and flammable contents, with walls, ceilings and floors of *noncombustible construction* or lined with noncombustible materials.

2) When it is not practicable to undertake hot work in an area described in Sentence (1),

- a) combustible and flammable materials within a 15 m distance from the hot work shall be protected against ignition in conformance with Article 5.2.3.2.,
- b) a fire watch shall be provided during the hot work and for a period of not less than 60 min after its completion in conformance with Article 5.2.3.3., and
- c) a final inspection of the hot work area shall be conducted 4 h after completion of work.

3) When there is a possibility of sparks leaking onto combustible materials in areas adjacent to the area where hot work is carried out,

- a) openings in walls, floors or ceilings shall be covered or closed to prevent the passage of sparks to such adjacent areas, or
- b) Sentence (2) shall apply to such adjacent areas.

### 5.2.3.2. Protection of Combustible and Flammable Materials

1) Any combustible and flammable material, dust or residue shall be

- a) removed from the area where hot work is carried out, or
- b) protected against ignition by the use of noncombustible materials.

2) Combustible materials or *building* surfaces that cannot be removed or protected against ignition as required in Sentence (1) shall be thoroughly wetted where hot work is carried out.

3) Any process or activity creating flammable gases or vapours, *combustible dusts* or *combustible fibres* in quantities sufficient to create a fire or explosion hazard shall be interrupted where hot work is carried out.

### 5.2.3.3. Fire Watch

1) The exposed areas described in Sentences 5.2.3.1.(2) and (3) shall be examined for ignition of combustible materials by personnel equipped with and trained in the use of fire extinguishing equipment.

### 5.2.3.4. Work on Containers, Equipment or Piping

1) Hot work shall not be performed on containers, equipment, or piping containing *flammable liquids* or *combustible liquids* or Class 2.1 flammable gases unless they have been cleaned and tested with a gas detector to ascertain that they are free of explosive vapours.

2) Hot work shall not be performed on a totally enclosed container.

3) Hot work shall not be performed on metal objects that are in contact with combustible materials unless safety precautions are taken to prevent their ignition by conduction.

#### 5.2.3.5. Work Adjacent to Piping

1) When hot work is to be carried out near piping containing Class 2.1 flammable gas, the piping shall

- a) conform to Sentence 5.2.3.4.(1), or
- b) be protected by a thermal barrier against the passage of heat.

#### 5.2.3.6. Fire Extinguishing Equipment

1) At least one portable fire extinguisher conforming to Part 6 shall be provided in the hot work area.

#### 5.2.3.7. Fire Safety Plan

1) In *buildings* or areas described in Article 2.8.1.1., the required fire safety plan shall include the safety measures described in this Subsection for the safe conducting of hot works.

## Section 5.3. Dust Producing Processes

### 5.3.1. General

#### 5.3.1.1. Application

1) This Section shall apply to *buildings* or parts of *buildings* where *combustible dusts* are produced in quantities or concentrations that create an explosion or fire hazard.

#### 5.3.1.2. Dust Removal

1) *Building* and machinery surfaces shall be kept clean of accumulations of *combustible dusts* using cleaning equipment that

- a) is made of materials that will not create electrostatic charges or sparks,
- b) is electrically conductive and bonded to ground, and
- c) except as permitted in Sentence (3), removes the dust to a safe location by suction.

2) When used in an atmosphere containing *combustible dusts*, the cleaning equipment required in Sentence (1) shall conform to electrical regulations made pursuant to the Safety Codes Act.

3) Where it is not possible to effectively remove dust by suction, it is permitted to use compressed air or other means which cause dust to be suspended in air during removal if, in the dust removal area,

- a) all sources of ignition are eliminated, and
- b) all machinery and equipment is de-energized, unless such equipment is suitable for use in atmospheres containing *combustible dusts*, in conformance with electrical regulations made pursuant to the Safety Codes Act.

#### 5.3.1.3. Dust-Collecting Systems

1) Dust-collecting systems shall be provided to prevent the accumulation of dust and keep suspended dusts at a safe concentration inside a *building*.

2) A dust-collecting system required in Sentence (1) shall be designed in conformance with good engineering practice such as described in NFPA 91, "Exhaust Systems for Air-Conveying of Materials" and the NFPA standards on dust explosion hazards, and shall

- a) be made of noncombustible materials, and
- b) prevent sparks due to physical contact in the fan assembly.

(See Appendix A.)

#### 5.3.1.4. Dust Collectors

1) Except as provided in Sentence (2), a dust collector having a capacity greater than 0.5 m<sup>3</sup>/s shall

- a) be located outside of a *building*, and
- b) be equipped with explosion venting to the outdoors of not less than 0.1 m<sup>2</sup> of vent area for each cubic metre of dust collector enclosure volume.

2) A dust collector described in Sentence (1) is permitted to be located inside a *building* if it is

- a) provided with explosion venting to the outdoors as specified in Clause (1)(b),
- b) equipped with an automatic explosion prevention system, or
- c) located in a room with *fire separations* having a *fire-resistance rating* of not less than 1 h and provided with explosion venting to the outdoors.

3) When air exhausted by a dust collector described in this Article is returned to a *building*, the dust collecting system shall be designed so that

- a) it will not create an explosion hazard inside the *building*, and
- b) the exhaust fan and ancillary equipment are automatically shut down in the event of a fire or an explosion inside the dust collector.

#### 5.3.1.5. Bonding and Grounding

1) Electrically conducting parts of conveying systems, dust collectors, dust producing

### 5.3.1.6.

machines and any equipment capable of accumulating static electricity located in an atmosphere containing *combustible dusts* shall be electrically bonded and grounded.

2) Static electricity shall be prevented from accumulating on machines or equipment subject to static electricity buildup by appropriate bonding, grounding and static eliminating devices.

#### 5.3.1.6. Explosion Venting

1) Except as provided in Article 5.3.1.7., an activity that creates an atmosphere containing significant concentrations of *combustible dusts* shall be located only in a *building* provided with explosion venting to the outdoors.

2) When explosion venting is required in this Section, it shall be designed to prevent critical structural and mechanical damage to the *building* in conformance with good engineering practice such as described in NFPA 68, "Venting of Deflagrations." (See A-3.2.8.2.(1)(d) in Appendix A.)

#### 5.3.1.7. Explosion Prevention Systems

1) In processes where an explosion hazard is present and conditions exist that prevent adequate explosion venting as required in this Section, an explosion prevention system shall be provided.

2) When an explosion prevention system is required in this Section, it shall be designed in conformance with good engineering practice such as described in NFPA 69, "Explosion Prevention Systems."

#### 5.3.1.8. Electrical Interlocks

1) Equipment required to have a dust-collecting system shall be interlocked to prevent it from operating if the dust-collecting system is not in operation.

#### 5.3.1.9. Separators

1) Separators shall be provided to prevent the entrance of foreign materials that may cause sparks in conveying equipment, dust collectors, dust producing machines and any equipment located in an atmosphere containing *combustible dusts*.

#### 5.3.1.10. Ignition Sources

1) Unless controlled in a manner that will not create a fire or explosion hazard, a device, operation or activity that produces open flames, sparks or heat shall not be permitted. (See A-4.1.5.3.(1) in Appendix A.)

2) Portable electrical equipment used in atmospheres containing *combustible dusts* shall conform to electrical regulations made pursuant to the Safety Codes Act.

3) Smoking shall not be permitted in atmospheres containing *combustible dusts*.

### 5.3.2. Woodworking Operations

#### 5.3.2.1. Exhaust Systems

1) Every machine that produces wood dust, particles or shavings shall be provided with a blower and exhaust system installed in conformance with

- a) NFPA 91, "Exhaust Systems for Air-Conveying of Materials," and
- b) NFPA 664, "Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities."

2) Operations or machines that generate sparks or combustible vapours shall not be served by exhaust systems connected to woodworking machines referred to in Sentence (1).

#### 5.3.2.2. Shavings and Sawdust Collection

1) Loose shavings and sawdust shall be collected at frequent intervals and deposited in receptacles described in Article 2.4.1.3.

#### 5.3.2.3. Fire Extinguishers

1) A portable extinguisher conforming to Part 6 shall be provided within 7.5 m of any machine producing wood dust, particles or shavings.

### 5.3.3. Grain Handling and Storage Facilities

#### 5.3.3.1. Storage Bins and Silos

1) A product subject to spontaneous heating shall be permitted to be stored in silos or bins only if measures are taken to

- a) monitor the temperature of the stored product, and
- b) prevent overheating of the stored product from creating a fire or explosion hazard.

2) Permanently open vent stacks are permitted to be used for the ventilation of storage bins where mechanical dust-collecting systems are not practical provided that the vent stacks

- a) have a cross-sectional area not less than twice that of all spouts discharging into the bin,
- b) are installed not more than 30° from the vertical,
- c) extend from the top of the bin to a point not less than 1.2 m above the roof, and
- d) are designed to prevent the entry of snow and rain.

**5.3.3.2. Conveying Equipment**

- 1) Belt conveyors and bucket elevator legs shall be equipped with safety devices to
  - a) detect excessive misalignment, blockage, slipping or slow-down of the conveying equipment, and
  - b) prevent conditions described in Clause (a) from creating a fire or explosion hazard by
    - i) alerting personnel trained in taking appropriate actions, or
    - ii) automatically stopping the conveying equipment.

2) Conveying equipment belts shall be made of static conductive materials to prevent buildup of static charges. (See Appendix A.)

- 3) Conveying equipment bearings shall be
  - a) accessible for inspection and maintenance,
  - b) lubricated to prevent overheating, and
  - c) kept free of accumulation of *combustible dusts*.

4) Belt conveyor galleries and tunnels and bucket elevator leg enclosures shall be provided with explosion venting to the outdoors in conformance with Sentence 5.3.1.6.(2).

**5.3.3.3. Separators**

1) Separators shall be provided at grain receiving points ahead of the conveying equipment. (See Article 5.3.1.9.)

**5.3.3.4. Fire Protection**

1) Portable fire extinguishers shall be provided in conformance with Part 6.

2) When a standpipe and hose system is provided, fog and fine spray nozzles shall be used to prevent *combustible dust* from being raised into suspension upon application of solid stream water discharge.

**Section 5.4. Spray Coating Operations****5.4.1. Scope****5.4.1.1. Application**

1) This Section shall apply to spray coating operations involving the use of combustible dry powders, *flammable liquids* or *combustible liquids*.

**5.4.2. Standards****5.4.2.1. Standards**

1) Except as required in Article 5.4.3.1., the operation of any process involving the use of *flammable liquids* or *combustible liquids* shall conform to NFPA 33, "Spray Application Using Flammable and Combustible Materials."

**5.4.3. Location****5.4.3.1. Fire Separations**

1) Except as provided in Article 1.1.2.3., the operation of any process involving *flammable liquids* or *combustible liquids* shall be separated from the remainder of the *building* in conformance with the Alberta Building Code. (See Appendix A.)

**Section 5.5. Dipping and Coating Processes****5.5.1. Scope****5.5.1.1. Application**

- 1) This Section shall apply to
  - a) processes in which products or materials are immersed in a dip tank containing *flammable liquids* or *combustible liquids*, and
  - b) the unatomized application of *flammable liquids* or *combustible liquids*, such as by flow coating or roll coating processes.

**5.5.2. Standards****5.5.2.1. Standards**

1) Except as required in Article 5.5.3.1., the operation of any process involving the use of *flammable liquids* or *combustible liquids* shall conform to NFPA 34, "Dipping and Coating Processes Using Flammable and Combustible Liquids."

**5.5.3. Location****5.5.3.1. Fire Separations**

1) Except as provided in Article 1.1.2.3., the operation of any process involving *flammable liquids* or *combustible liquids* shall be separated from the remainder of the *building* in conformance with the Alberta Building Code. (See A-5.4.3.1.(1) in Appendix A.)

## Section 5.6. Special Processes Involving Flammable and Combustible Liquids

### 5.6.1. Industrial Ovens

#### 5.6.1.1. Application

1) This Subsection applies to industrial baking and drying ovens which during operation contain flammable vapours given off by the products being baked or dried.

2) Except as provided in Article 1.1.2.3., industrial ovens described in Sentence (1) shall be installed in conformance with the Alberta Building Code.

#### 5.6.1.2. Location

1) Industrial ovens shall not be located in a *basement* or any other area below grade.

#### 5.6.1.3. Materials

1) Industrial ovens shall be fabricated of noncombustible materials with smooth interior surfaces to permit cleaning.

#### 5.6.1.4. Limiting Temperature

1) Ovens, heaters and associated ductwork shall have sufficient clearance or be insulated where necessary to prevent the temperature from exceeding 90°C at any combustible part of the *building* assembly.

#### 5.6.1.5. Explosion Venting

1) Industrial ovens shall be provided with explosion venting conforming to good engineering practice such as described in NFPA 68, "Venting of Deflagrations."

#### 5.6.1.6. Ducts and Stacks

1) Ducts, stacks and associated insulation in systems for the removal of flammable vapours shall

- be of noncombustible materials,
- not pass through *firewalls*, and
- discharge outdoors not less than
  - 1.5 m from unprotected *building* openings, and
  - 6 m from air intake openings.

#### 5.6.1.7. Ventilation

1) Ovens in which flammable vapours may be present or through which products of combustion are circulated shall be ventilated in accordance with NFPA 86, "Ovens and Furnaces."

#### 5.6.1.8. Fan Interlocks

1) In ovens where flammable vapours may be present, interlocks shall be provided to ensure that energy sources and ignition devices are de-activated when

- the ventilating fans stop, or
- the excess temperature controls are activated.

2) In continuous process ovens where flammable vapours may be present, interlocks shall be provided to ensure

- that all ventilating fans are operating before conveyors can be started, and
- that the conveyors are stopped when
  - the ventilating fans stop, or
  - the excess temperature controls are activated.

#### 5.6.1.9. Inspection, Cleaning and Maintenance

1) Ovens and associated ductwork shall be inspected, cleaned and maintained internally and externally at sufficient intervals to prevent the accumulation of combustible deposits.

2) Access doors or panels shall be provided to permit inspection, cleaning and maintenance of ovens and associated ductwork.

3) Fixed noncombustible ladders, steps or grab rails shall be provided to permit access to the doors or panels required in Sentence (2).

#### 5.6.1.10. Portable Extinguishers

1) Portable extinguishers shall be provided in conformance with Part 6.

#### 5.6.1.11. Standpipe and Hose Systems

1) A standpipe and hose system shall be installed in conformance with the Alberta Building Code and equipped with spray nozzles so that all parts of an oven structure can be reached by a hose stream.

#### 5.6.1.12. Fire Access Doors

1) Doors or other means of access shall be provided in ovens and associated ductwork so that portable extinguishers or hose streams can be used in all parts of the equipment.

#### 5.6.1.13. Fire Suppression Systems

1) Ovens containing or processing sufficient combustible materials to sustain a fire shall be protected by an automatic fire suppression system conforming to Part 6.

## 5.6.2. Dry Cleaning Plants

### 5.6.2.1. Dry Cleaning Plants

1) Dry cleaning plants shall conform to NFPA 32, "Drycleaning Plants."

## 5.6.3. Fumigation and Thermal Insecticidal Fogging

### 5.6.3.1. Application

1) This Subsection applies to the fumigation or thermal insecticidal fogging of *buildings*, including the fumigation of equipment or commodities within structures, tanks or bins or under tarpaulins.

### 5.6.3.2. Notification

1) The fire department shall be notified before any operation described in Article 5.6.3.1. is conducted.

2) The occupants of any premises adjacent to that in which fumigation or thermal insecticidal fogging is to take place shall be given prior notice.

### 5.6.3.3. Ignition Sources

1) All flames and other sources of ignition shall be eliminated in any part of a *building* undergoing fumigation or thermal insecticidal fogging.

### 5.6.3.4. Electric Power

1) Electric power supply shall be shut off to the premises undergoing fumigation or thermal insecticidal fogging.

### 5.6.3.5. Air Temperature

1) The air temperature in the part of a *building* undergoing fumigation or thermal insecticidal fogging shall be kept sufficiently low to prevent the actuation of any sprinkler or fire alarm system.

### 5.6.3.6. Access to Premises

1) No person shall be permitted to enter a premise undergoing fumigation or thermal insecticidal fogging until the premise has been ventilated and is safe.

2) Warning signs shall be posted in a conspicuous location near every entrance to the premises being fumigated.

3) One person shall be on duty at each entrance to premises undergoing fumigation or thermal insecticidal fogging to prevent any person

from entering until such premises have been ventilated.

## 5.6.4. Floor Finishing

### 5.6.4.1. Application

1) Floor finishing operations involving the use of *flammable liquids* or *combustible liquids* shall conform to Part 4 and this Subsection.

### 5.6.4.2. Public Access

1) Any part of a *building* where floor finishing operations are done shall not be open to the public.

### 5.6.4.3. Ventilation

1) Ventilation shall be provided in areas where floor finishing operations are done to prevent the accumulation of flammable vapours.

2) Ventilation required in Sentence (1) is permitted to be provided by mechanical systems if their use does not constitute a source of ignition.

### 5.6.4.4. Sources of Ignition

1) All mechanical systems, electric motors and other equipment which might be a source of ignition shall be shut down, and smoking and the use of open flames shall be prohibited during the application of Class I liquids and for at least 1 h after such application.

### 5.6.4.5. Waste Receptacles

1) A receptacle conforming to Article 2.4.1.3. shall be provided for all waste rags and materials used in operations involving *flammable liquids* or *combustible liquids*, and the contents shall be removed daily and disposed of in a manner that will not create a fire hazard.

# Section 5.7. Laboratories

## 5.7.1. Scope

### 5.7.1.1. Application

1) This Section shall apply to laboratories where *dangerous goods*, including *flammable liquids* and *combustible liquids*, are used.

2) Except as otherwise specified in this Section, the use, handling and storage of *dangerous goods*, including *flammable liquids* and *combustible liquids*, shall conform to Parts 3, 4 and 5.

## 5.7.2.1.

### 5.7.2. Construction

#### 5.7.2.1. Interior Finish Materials

1) Interior finish materials, floors, fixed furniture and equipment shall be chemically resistant to *dangerous goods* being used in a laboratory to minimize their deterioration, in conformance with Articles 3.2.7.7. and 3.2.7.8.

#### 5.7.2.2. Separation

1) A laboratory shall be separated from other parts of the *building* by *fire separations* conforming to this Code and the Alberta Building Code, but having a *fire-resistance rating* of not less than 1 h.

### 5.7.3. Fire Prevention and Protection

#### 5.7.3.1. Emergency Planning

1) Except as provided in Sentences (2) to (6), a laboratory shall conform to the requirements for emergency planning in Section 2.8. and for a fire safety plan in Subsection 5.1.5.

2) Fire drills required in Subsection 2.8.3. shall be held at intervals not greater than 3 months in a laboratory.

3) Personnel working in a laboratory shall be trained in the safe handling and use of *dangerous goods*, in conformance with Article 3.2.7.15.

4) *Dangerous goods* shall be identified in conformance with Article 3.2.7.13.

5) The laboratory shall be clearly designated as an area containing *dangerous goods* in conformance with Article 3.2.7.14.

6) Measures shall be taken to prevent access to the laboratory by unauthorized persons.

#### 5.7.3.2. Combustible Materials

1) Where combustible materials, such as packaging materials, are used in a laboratory, their quantity shall not be greater than the supply for one day of normal operation.

2) Combustible materials in excess of those permitted in Sentence (1) shall be stored outside of the laboratory in conformance with Section 3.2.

#### 5.7.3.3. Spill Control

1) Absorbent and neutralizing materials shall be provided in the laboratory and in the *dangerous goods* storage areas in conformance with Sentence 3.2.7.11.(2).

#### 5.7.3.4. Electrical Equipment

1) Except as provided in Sentence 5.7.3.5.(3), electrical equipment in areas where the concentration of flammable vapours can be greater than 25% of its *lower explosive limit* shall be in conformance with electrical regulations made pursuant to the Safety Codes Act for Class I, Division 1 hazardous locations.

2) Electrical equipment located inside a power-ventilated enclosure required in Article 5.7.4.2. and its exhaust duct system shall

- conform to Sentence (1), and
- be designed and maintained to prevent the accumulation of combustible or reactive deposits.

#### 5.7.3.5. Ignition Sources

1) Smoking shall not be permitted in a laboratory and signs shall be posted in conformance with Article 2.4.2.2.

2) Where overheating of unattended equipment using heat can cause a fire or an explosion, such equipment shall be equipped with a high temperature limit switch fitted to

- sound an alarm, and
- shut off the heat.

3) An ignition source that is an integral part of an operation involving flammable vapours shall be permitted provided

- the supply of *flammable liquids* or *combustible liquids* for this operation is controlled and kept to a strict minimum,
- flammable vapours and combustion fumes are exhausted in conformance with Article 5.7.4.2.,
- there is no other source of ignition capable of igniting the flammable vapours in an uncontrolled manner, and
- there is no combustible material in the immediate vicinity of this operation.

#### 5.7.3.6. Inspection and Maintenance

1) Electrical equipment, mechanical systems, piping, valves, and automatic and manual control and safety devices shall be inspected, tested and maintained in good operating condition at all times.

2) The ventilation systems serving a laboratory shall be inspected and cleaned to prevent the accumulation of combustible or reactive deposits, and the intervals between inspections shall be not greater than

- 12 months for the ventilation systems of the laboratory and *dangerous goods* storage areas, and
- 6 months for the ventilation system of a power-ventilated enclosure required in Article 5.7.4.2.

**5.7.3.7. Fire Protection**

1) Portable fire extinguishers shall be provided in the laboratory in conformance with Part 6.

**5.7.4. Ventilation****5.7.4.1. General Ventilation**

1) A laboratory shall be provided with continuous mechanical ventilation designed and maintained 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 in this Section 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.

**5.7.4.2. Power-Ventilated Enclosure**

1) The use of *dangerous goods* in a laboratory shall be confined inside a power-ventilated enclosure conforming to Articles 5.7.4.3. and 5.7.4.4. when

- a) their use releases flammable vapours, or causes run-away or potentially explosive reactions,
- b) liquids are heated to a temperature equal to or greater than their *flash point*, or
- c) Class I liquids or *unstable liquids* are used.

2) A power-ventilated enclosure required in Sentence (1) shall not be used for the storage of *dangerous goods*, and any quantity in excess of the supply necessary for normal operations shall conform to Subsection 5.7.5.

**5.7.4.3. Enclosure Exhaust Ventilation**

1) The ventilation system for a power-ventilated enclosure required in Article 5.7.4.2. shall

- a) conform to NFPA 91, "Exhaust Systems for Air-Conveying of Materials,"
- 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 of the power-ventilated enclosure, and
  - ii) readily accessible in case of an emergency.

2) Where deposits referred to in Clause (1)(b) can accumulate in the power-ventilated enclosure and its exhaust duct system and create a fire or explosion hazard,

- a) provisions shall be made to remove such deposits so they do not create a fire or explosion hazard, or
- b) an automatic fire suppression system shall be provided in conformance with Part 6.

**5.7.4.4. Enclosure Construction**

1) The power-ventilated enclosure required in Article 5.7.4.2. 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,
- b) be provided with access doors to permit inspection and maintenance of the fan assembly and exhaust ducts,
- c) be provided with instructions for its use and the operation of the ventilation system, and
- d) be provided with means to control accidental spillage in conformance with Subsection 4.1.6.

2) Combustible materials are permitted in systems described in Clause (1)(a) 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 in Sentence (2) is permitted to be greater than 25 if an automatic fire suppression system conforming to Part 6 is provided inside the power-ventilated enclosure and its exhaust duct system.

**5.7.5. Dangerous Goods****5.7.5.1. Maximum Quantities**

1) The quantity of *dangerous goods* kept in a laboratory shall be minimized and shall not exceed the lesser of

- a) the supply necessary for normal operation, or

## 5.7.5.2.

- b) when located in
  - i) a Group A, Division 2 educational or Group D *major occupancy*, 300 L of *flammable liquids* and *combustible liquids*, of which not more than 50 L shall be Class I liquids, or
  - ii) a Group B *major occupancy*, the quantities of *flammable liquids* and *combustible liquids* permitted in Sentence 4.2.6.3.(1).

**2)** Quantities of *flammable liquids* and *combustible liquids* in excess of those permitted in Sentence (1) shall be stored in

- a) cabinets conforming to Subsection 4.2.10. except that, in laboratories described in Clause (1)(b), the total quantity of *flammable liquids* and *combustible liquids* stored in such cabinets shall not exceed the quantity permitted for one cabinet, or
- b) a room conforming to Subsection 4.2.9.

**3)** Quantities of *dangerous goods* other than *flammable liquids* and *combustible liquids* in excess of those permitted in Sentence (1) shall be stored outside of the laboratory in conformance with Part 3.

### 5.7.5.2. Containers for Flammable and Combustible Liquids

**1)** Except as provided in Sentences (2) and (3), *flammable liquids* or *combustible liquids* in a laboratory shall be kept in containers conforming to Subsection 4.2.3.

**2)** Where Class I liquids are required to be kept in individual containers having a capacity greater than 5 L in a laboratory, such containers shall

- a) be safety containers conforming to ULC/ORD-C30, "Safety Containers," and
- b) have a capacity of not more than 25 L.

**3)** Containers of *flammable liquids* or *combustible liquids* shall be kept closed when not in use.

### 5.7.5.3. Compressed Gases

**1)** Storage cylinders and piping systems for Class 2 gases used in a laboratory shall be firmly secured and protected against mechanical damage.

**2)** Each point of supply and each point of use of cylinders or piping systems for Class 2 gases shall be provided with

- a) labels identifying the gas being supplied, and
- b) a manual shut-off valve.

**3)** A Class 2 gas cylinder valve shall be closed when not in use.

### 5.7.5.4. Refrigerated Storage

**1)** Where refrigerators are required to keep Class I liquids at a temperature below normal ambient conditions in a laboratory, such refrigerators shall be designed so that

- a) electrical equipment located within the storage compartment, within the outer shell, on the door and on the door frame of the refrigerator is in conformance with electrical regulations made pursuant to the Safety Codes Act for Class I, Division 1 hazardous locations, and
- b) electrical equipment mounted on the outside surface of the refrigerator is
  - i) in conformance with electrical regulations made pursuant to the Safety Codes Act for Class I, Division 2 hazardous locations, or
  - ii) located above the top of the storage compartment.

**2)** Refrigerators described in Sentence (1) shall be identified in conformance with Article 3.2.7.14.

**3)** Class I liquids in refrigerators shall be kept in *closed containers*.

### 5.7.5.5. Perchloric Acid

**1)** Where perchloric acid is heated above normal ambient temperature, it shall be done in a separate power-ventilated enclosure

- a) conforming to Articles 5.7.4.3. and 5.7.4.4., and
- b) provided with conspicuously posted instructions specifying that it shall be used only for this application.

**2)** The power-ventilated enclosure required in Sentence (1) and its exhaust duct system shall be washed with water after each use to prevent the accumulation of highly reactive deposits.

**3)** Heating of perchloric acid shall not be by open flame or hot oil bath.

### 5.7.5.6. Chemical Wastes

**1)** Wastes from *dangerous goods* shall be

- a) identified to prevent accidental mixing of incompatible chemicals, and
- b) included in the quantities specified in Article 5.7.5.1.

## Section 5.8. Fireworks

### 5.8.1. Fireworks

#### 5.8.1.1. Flares

**1)** Articles 5.8.1.2. to 5.8.1.15. do not apply to a person who possesses or discharges *fireworks* commonly used as distress flares.

#### 5.8.1.2. Application

**1)** The manufacture and importation of *fireworks* shall be in conformance with the "Explosives Act" (Canada) and its Regulations.

**2)** The transportation of *fireworks* shall be in conformance with the "Transportation of Dangerous Goods Act" and its Regulations.

#### 5.8.1.3. Discharge

**1)** Except as permitted in Clause 5.8.1.7.(1)(b), no person shall discharge, fire or set off *fireworks* from, on or over

- a) public land as defined in the Public Lands Act, or
- b) a forest protection area designated under the Forest and Prairie Protection Act.

#### 5.8.1.4. Prohibited

**1)** No person shall have in his possession, sell, offer for sale, give away or otherwise distribute, discharge, fire or set off

- a) *firecrackers*, or
- b) unless acceptable to the *authority having jurisdiction*, any other pyrotechnic device.

#### 5.8.1.5. Activities

**1)** No person shall discharge, fire or set off *fireworks*

- a) in a place or in a manner that creates a danger or constitutes a nuisance to any person or property,
- b) on a highway, road allowance, public beach or park unless he first obtains written permission from the *authority having jurisdiction*,
- c) on privately owned land unless he
  - i) first obtains the written consent of the *owner* or occupant of that land and the *owner* or occupant of neighbouring land on which debris might reasonably be expected to fall, and
  - ii) provides a copy of this consent required in Subclause (i) together with his application for a permit under this Section to the *authority having jurisdiction*,

- d) in a *building* or place, unless
  - i) the *fireworks* are specifically designed and clearly marked by the manufacturer for such use, and
  - ii) the *building* or place is acceptable to the *authority having jurisdiction*,
- e) within 10 m of any *building*, tent, trailer, canvas shelter or motor vehicle,
- f) within 200 m of any place where explosives or *flammable liquids* or *combustible liquids* or substances are manufactured or stored,
- g) within 250 m of a correctional institution as defined in the Corrections Act, a facility as defined in the Mental Health Act, a nursing home within the meaning of the Nursing Homes Act, a social care facility as defined in the Social Care Facilities Licensing Act, a hospital as defined in the Hospitals Act, an educational institution or a church, unless acceptable to the *authority having jurisdiction*, or
- h) when the wind velocity exceeds 45 km/h or when, in the opinion of the *authority having jurisdiction*, weather conditions create an undue fire hazard.

**2)** The *authority having jurisdiction* may order a person to cease the discharging, firing or setting off of *fireworks* when he considers it necessary to do so for reasons of safety.

#### 5.8.1.6. Authority

**1)** The *authority having jurisdiction*, or *forest officer* in the forest protection area, may seize, take, remove or cause to be seized, taken or removed any *fireworks* offered or exposed for sale or being held or used contrary to

- a) this Section, or
- b) a permit issued in accordance with this Section.

**2)** Where *fireworks* are seized in accordance with Sentence (1), the *authority having jurisdiction*, or *forest officer* in the forest protection area, may order them disposed of in a safe manner.

**3)** Any costs incurred as a result of the seizure or disposal of *fireworks* by the *authority having jurisdiction*, or *forest officer* in the forest protection area, in accordance with Sentences (1) and (2) shall be borne by

- a) the person in possession of the *fireworks* at the time of seizure, in the case of seizure under Clause (1)(a), or
- b) the permit holder, in the case of seizure under Clause (1)(b).

## 5.8.1.7.

### 5.8.1.7. Permit

- 1) No person shall
  - a) purchase, possess, handle, discharge, fire or set off *fireworks* unless he holds a permit for that purpose issued by the *authority having jurisdiction*, or
  - b) discharge, fire or set off *fireworks* in the forest protection area unless he holds a permit for that purpose issued by a *forest officer*.
- 2) A permit issued under Sentence (1)
  - a) shall specify the date, time and location on which the *fireworks* are to be discharged, and
  - b) may contain any other terms and conditions the *authority having jurisdiction* or *forest officer* considers necessary to ensure the safe use of the *fireworks*.
- 3) No person shall sell, offer for sale or store for the purposes of sale *fireworks* unless he holds a permit issued for that purpose by the *authority having jurisdiction*.
- 4) An application for a permit under Sentence (3) shall be accompanied by a copy of the applicant's current business licence issued by the municipality in which the applicant carries on business.
- 5) The *authority having jurisdiction* or *forest officer* shall not issue a permit under this Section in respect of *high hazard fireworks* unless the applicant possesses a *fireworks* supervisor card issued pursuant to the "Explosives Act" (Canada) and its Regulations.

### 5.8.1.8. Employees

- 1) The holder of a permit referred to in Article 5.8.1.7. shall ensure that all of his employees who deal with *fireworks* for the purposes of sale are at least 18 years of age.

### 5.8.1.9. Restrictions

- 1) No person shall give, sell or offer for sale *fireworks*
  - a) to any person who is under 18 years of age, or
  - b) to any person unless that person is the holder of a permit issued under Article 5.8.1.7.

### 5.8.1.10. Age Requirement

- 1) No person who is under 18 years of age shall purchase, possess, handle, discharge, fire or set off *fireworks*.

### 5.8.1.11. Conditions

- 1) A person who sells *fireworks* or offers them for sale shall ensure that

- a) manufacturer's instructions on the safe use of *fireworks* are provided with each sale,
- b) notices acceptable to the *authority having jurisdiction* are posted at the sales outlet outlining the instructions referred to in Clause (a),
- c) a record of each sale is kept on the premises where the sale occurs for a period of not less than two years following the date of the sale,
- d) a record referred to in Clause (c) shows
  - i) the date of the sale,
  - ii) the name, address and phone number of the purchaser,
  - iii) a description of the *fireworks* sold,
  - iv) the date and time the *fireworks* will be discharged, and
  - v) the location and a description of the site where the *fireworks* will be discharged.

- 2) A person who sells *fireworks* or offers them for sale shall make available the record referred to in Clause (1)(c) when requested to do so by the *authority having jurisdiction*.

### 5.8.1.12. Discharging

- 1) *Fireworks* from which a projectile is discharged shall be set up in such a manner so that when ignited the projectile will go into the air in a vertical direction not more than 15° off the perpendicular.

### 5.8.1.13. Discharging Ground Level

- 1) Where ground level *fireworks* are discharged
  - a) they shall be positioned out of the firing range of aerial *fireworks*, and in a location where there is not dry grass or combustible material on the ground beneath them, and
  - b) the area shall be thoroughly wet down immediately before the *fireworks* are discharged.

### 5.8.1.14. Extinguisher

- 1) A *listed* and *labelled* fire extinguisher having a minimum 2-A rating shall be provided and kept in the immediate discharge area.

### 5.8.1.15. Display

- 1) Where *high hazard fireworks* are discharged, the permit holder shall ensure that
  - a) he has at least 2 assistants who are competent persons over 18 years of age and have been trained in the proper handling of *fireworks*,

- b) the *fireworks* are set up in conformance with the "Fireworks Manual," published by Natural Resources Canada,
- c) at least 2 *listed* and *labelled* minimum 2-A rated fire extinguishers are located not more than 45 m from the location at which the *fireworks* are discharged,
- d) the potential landing area is cleared of spectators, vehicles, dry grass and other combustible material immediately prior to the beginning of the display and during the display,
- e) nothing other than a flashlight or electrical lighting is used for artificial illumination,
- f) no person, other than persons responsible for discharging the *fireworks*, is closer than 45 m from the location at which the *fireworks* are being discharged,
- g) the location at which the *fireworks* are discharged is at least
  - i) 60 m from any highway or other similar means of travel used by the public, and
  - ii) 15 m from the nearest overhead obstruction,
- h) a complete search is conducted of the display area for any duds within 12 hours of the conclusion of the display, and
  - i) any unused *fireworks* or duds remaining are disposed of in a safe manner within 12 hours of the conclusion of the display.



# Part 6

## Fire Protection Equipment

### Section 6.1. General

#### 6.1.1. General

##### 6.1.1.1. Application

- 1) This Part provides for
  - a) the installation, inspection, testing, maintenance and operation of automatic sprinkler systems, special extinguishing systems, and portable extinguishers, and
  - b) the inspection, testing, maintenance and operation of water supplies for fire protection, fire alarm systems, standpipe and hose systems, and emergency power installations.

##### 6.1.1.2. Maintenance

1) Fire protection installations shall be maintained in operating condition. (See Appendix A.)

2) Specialized fire protection installations not specifically regulated by this Code shall be inspected, tested, maintained and operated in accordance with standards acceptable to the *authority having jurisdiction*.

##### 6.1.1.3. Notification

1) Where tests, repairs or alterations are made to fire protection installations, including sprinkler and standpipe systems, a procedure of notification acceptable to the fire department shall be established, and such procedure may include the notification of the fire department and the *building* occupants.

2) When any alterations, additions or repairs are being made to a *building* that necessitate interruption of sprinkler protection, the person making the alterations, additions or repairs shall notify the fire department before they are made.

3) No person shall shutdown, disconnect or otherwise impair a sprinkler control valve or sprinkler water supply unless he first obtains the approval of the fire department and notifies the *owner* or his agent.

4) Where a person who carries out the maintenance of a portable fire extinguisher, fire

extinguishing system, fire alarm system or a fire alarm device discovers that the device or system is inoperative or defective and the *owner* or his authorized agent is unwilling or unable to correct the defect, the person carrying out the maintenance shall forthwith, in writing, notify the fire department and the *owner* or his authorized agent of that notification.

5) When alterations or repairs are being made to hydrants, the person making the alterations or repairs shall notify the fire department before they are made.  
(See Appendix A.)

6) No person shall shutdown or otherwise impair the operation of a hydrant unless he first notifies and obtains the approval of the fire department.  
(See A-6.1.1.3.(5) in Appendix A.)

7) Sentences (2) and (3) do not apply to industrial or manufacturing facilities maintaining their own *fire brigades*.

##### 6.1.1.4. Protection during Shutdown

1) When any portion of a fire protection system is temporarily shut down, alternative measures shall be taken to ensure that protection is maintained. (See Appendix A.)

##### 6.1.1.5. Records

1) Unless otherwise stated in this Part, records indicating inspection, testing and maintenance of fire protection equipment shall be on appropriate forms in conformance with Sentence (2) and be retained for examination by the *authority having jurisdiction* in accordance with Article 1.1.1.2.

- 2) Appropriate forms required by Sentence (1) shall be taken from
  - a) NFPA, "Fire Protection Systems, Inspection, Test and Maintenance Manual, 2nd Edition,"
  - b) ULC-S536-M, "Inspection and Testing of Fire Alarm Systems," or
  - c) ULC-S537-M, "Verification of Fire Alarm Systems."

## 6.1.1.6.

### 6.1.1.6. Qualifications

- 1) Only qualified persons shall install, test or perform maintenance on a lightning protection system described in Section 6.10. (See Appendix A.)
- 2) Only qualified persons shall install, test or perform maintenance on
  - a) a special fire suppression system described in Section 6.8. (see Appendix A),
  - b) a fire alarm and detection system described in Section 6.3. (see Appendix A), or
  - c) portable fire extinguishers described in Subsection 6.2.4. (see Appendix A).

## Section 6.2. Portable Extinguishers

### 6.2.1. General

#### 6.2.1.1. Selection and Installation

- 1) Portable extinguishers shall be selected and installed in conformance with NFPA 10, "Portable Fire Extinguishers" and with this Code.
- 2) No person shall sell, lease, offer for sale or lease or install a portable extinguisher unless the extinguisher is *listed* and *labelled*.

#### 6.2.1.2. Standards

- 1) Portable extinguishers shall conform to
  - a) CAN/ULC-S503-M, "Carbon Dioxide Hand and Wheeled Fire Extinguishers,"
  - b) CAN/ULC-S504-M, "Dry Chemical and Dry Powder Hand and Wheeled Fire Extinguishers,"
  - c) CAN/ULC-S507, "9 Litre Stored Pressure Water Type Fire Extinguishers," or
  - d) CAN/ULC-S512-M, "Halogenated Agent Hand and Wheeled Fire Extinguishers."

(See Appendix A.)

#### 6.2.1.3. Location

- 1) Portable extinguishers shall be located in or adjacent to corridors or aisles that provide *access to exits*.
- 2) Portable extinguishers in proximity to a fire hazard shall be located so as to be accessible without exposing the operator to undue risk. (See Appendix A.)

#### 6.2.1.4. Instructions

- 1) All instructions for operating, maintaining and recharging portable extinguishers shall be permanently fixed to each unit.

### 6.2.1.5. Corrosive Atmospheres

- 1) Portable extinguishers subject to damage in a corrosive atmosphere shall not be installed where such an atmosphere exists without providing appropriate corrosion protection for the extinguisher.

### 6.2.1.6. Mounting Brackets

- 1) When portable extinguishers are located on vehicles or in areas where they are subject to jarring or vibration, brackets designed to accommodate these effects shall be used.

### 6.2.1.7. Health and Safety Hazard

- 1) Portable extinguishers shall be of a type that does not constitute a hazard to health and safety in its maintenance and use.

### 6.2.2. Classification and Identification

#### 6.2.2.1. Classification of Fires

- 1) For the purposes of this Section, fires are identified as *Class A*, *Class B*, *Class C* and *Class D fires*. (See Appendix A.)

#### 6.2.2.2. Rating of Extinguishers

- 1) Portable extinguishers shall be rated and identified in conformance with CAN/ULC-S508-M, "Rating and Fire Testing of Fire Extinguishers and Class D Extinguishing Media."

### 6.2.3. Installation Requirements

#### 6.2.3.1. Hazard Protection

(See Appendix A.)

- 1) Portable extinguishers shall be provided for the protection of the *building* structure and *occupancy* hazards in conformance with this Subsection and as specified elsewhere in this Code.

#### 6.2.3.2. Dwelling Units

- 1) Portable extinguishers shall be installed in all *buildings* except *dwelling units*.

#### 6.2.3.3. Extinguishers for Class A Fires

- 1) Portable extinguishers for *Class A fires* shall be provided as required in Table 6.2.3.3., but in no case shall there be fewer than one extinguisher per *storey* having a minimum rating of 2-A.

**Table 6.2.3.3.**  
**Portable Extinguishers for Class A Fires**  
 Forming Part of Sentence 6.2.3.3.(1)

	Light Hazard Occupancy <sup>(1)</sup>	Ordinary Hazard Occupancy <sup>(1)</sup>	Extra Hazard Occupancy <sup>(1)</sup>
Minimum extinguisher rating	2-A	2-A	4-A <sup>(2)</sup>
Maximum <i>floor area</i> , m <sup>2</sup> , per unit of rating <sup>(3)</sup>	300	150	100
Maximum <i>floor area</i> per extinguisher, m <sup>2</sup>	1 100	1 100	1 100
Maximum travel distance to extinguisher, m	25	25	25

**Notes to Table 6.2.3.3.:**

(1) Classified in accordance with NFPA 10, "Portable Fire Extinguishers."

(2) Two 2-A rated extinguishers are permitted to be used to fulfill the requirement for one 4-A rated extinguisher.

(3) Per unit of the numerical component of the extinguisher rating.

**2)** Where it is apparent that intense fires may occur because of the character or quantity of combustibles, the *authority having jurisdiction* may require portable extinguishers suitable for the high hazard in addition to those required by this Section. (See A-6.2.3.1. in Appendix A.)

**6.2.3.4. Hose Stations in Lieu of Extinguishers**

**1)** Up to half of the number of portable extinguishers required per *floor area* in Table 6.2.3.3. are permitted to be replaced by hose stations that are

- equipped with not less than 23 m of hose conforming to CGSB 20-GP-12Ma, "Braided Water Hose, Knitted or Spiral Wound Reinforcement,"
- connected to a permanent water supply, and
- spaced so that the travel distance to the nearest hose does not exceed 25 m.

**2)** The water supply piping and hose referred to in Sentence (1) shall be not less than 19 mm diameter, and the hose shall be equipped with a combination water-spray nozzle that is acceptable to the *authority having jurisdiction*.

**6.2.3.5. Extinguishers for Class B Fires**

**1)** Portable extinguishers for *Class B fires* shall be provided as required in Table 6.2.3.5.

**6.2.3.6. Extinguishers for Commercial Cooking Equipment**

**1)** Except as provided in Sentence (2), a 40B alkali base dry chemical or a 1B wet chemical portable fire extinguisher shall be provided to protect commercial cooking equipment.

**2)** A 1B wet chemical portable fire extinguisher shall be provided when the commercial cooking equipment is protected by an automatic wet chemical fire suppression system.

**6.2.3.7. Extinguishers for Class C Fires**

**1)** Portable extinguishers for *Class C fires* shall be provided for fires in or near electrical equipment.

**2)** Distribution of portable extinguishers for *Class C fires* shall conform to the applicable provisions for the distribution of extinguishers for *Class A* or *Class B fires* in the vicinity of the electrical equipment.

**Table 6.2.3.5.**  
**Portable Extinguishers for Class B Fires**  
 Forming Part of Sentence 6.2.3.5.(1)

Grade of Hazard <sup>(1)</sup>	Basic Minimum Extinguisher Rating	Maximum Travel Distance to Extinguishers, m
Light	5-B	9
	10-B	15
Ordinary	10-B	9
	20-B	15
Extra	40-B	9
	80-B	15

**Notes to Table 6.2.3.5.:**

(1) Graded in conformance with NFPA 10, "Portable Fire Extinguishers."

## 6.2.4.1.

### 6.2.4. Inspection, Testing and Maintenance

#### 6.2.4.1. Inspection, Testing and Maintenance

1) Except as otherwise required in this Section, inspection, testing, maintenance and recharging of portable extinguishers shall be in conformance with NFPA 10, "Portable Fire Extinguishers."

2) All agencies servicing, recharging or carrying out the repair and overhaul of fire extinguishing equipment shall have their facilities and equipment certified

- annually by an *approved* fire testing agency, and
- by Transport Canada or its appointee for high pressure hydrostatic testing equipment.

#### 6.2.4.2. Defective Extinguishers

1) Portable extinguishers having defects shall be repaired or recharged where necessary to ensure the extinguisher will operate effectively and safely.

2) Extinguisher shells, cartridges or cylinders which show leakage or permanent distortion in excess of specified limits or which rupture shall be removed from service.

#### 6.2.4.3. Retests

1) Retests shall be conducted at the original hydrostatic test pressure as stated on the nameplate.

#### 6.2.4.4. Labels

1) A label shall be fixed to the extinguisher after testing indicating the month and year the hydrostatic pressure test was performed and including the test pressure used and the name of the person or agency performing the test.

#### 6.2.4.5. Tags

1) Except as provided in Sentence (2), each portable extinguisher shall have a tag securely attached to it showing

- type of extinguisher,
- size of extinguisher,
- serial number of extinguisher,
- date of last annual maintenance,
- date of last recharge,
- a five year, monthly inspection and annual maintenance record,
- name of the *owner* of the extinguisher,
- name, address and telephone number of the service agency,
- certification number of the recognized testing agency, and

- space for the printed name and signature of the service person.

2) Bar coding and other technologies acceptable to the *authority having jurisdiction* may be used as a means of record keeping provided

- an information record in accordance with Sentence (1) is available at the premise where the extinguisher is located, and
- the tag on the extinguisher contains information indicating
  - a five year monthly inspection record for use by the *owner*,
  - name of the *owner* of the extinguisher,
  - name, address and telephone number of the service agency,
  - certification number of the recognized testing agency, and
  - space for the printed name and signature of the service person.

3) Where service information is required to be placed on the tag monthly or annually, the information must be handwritten.

#### 6.2.4.6. Records

1) A written record, including the automatic chart recorder record, in accordance with the "Transportation of Dangerous Goods Act" and its Regulations, shall be kept of all high pressure hydrostatic testing for a period of 12 years.

2) The month and year that the hydrostatic test was performed and the servicing agency's Transport Canada identification stamp shall be stamped on the shoulder of the unit.

## Section 6.3. Fire Alarm and Voice Communication Systems

### 6.3.1. General

#### 6.3.1.1. Maintenance

1) Fire alarm and voice communication systems shall be maintained in operable condition at all times.

#### 6.3.1.2. Inspection and Testing

1) Fire alarm systems shall be inspected and tested in conformance with ULC-S536-M, "Inspection and Testing of Fire Alarm Systems."

2) Fire alarm and detection system components shall be accessible for purposes of inspection or maintenance.

**6.3.1.3. Records**

1) A record shall be kept of all tests required by Sentence 6.3.1.2.(1), and such records shall be retained for examination by the *authority having jurisdiction* in conformance with Article 1.1.1.2.

**6.3.1.4. Proprietary Signalling Systems**

1) Proprietary signalling systems shall be maintained in conformance with NFPA 72, "National Fire Alarm Code."

**6.3.1.5. Voice Communication Systems**

1) Voice communication systems that are integrated with a required fire alarm system shall be tested in conformance with Article 6.3.1.2.

2) Voice communication or public address systems that are part of the *building* evacuation plan and are not electrically supervised shall be tested at intervals not greater than one month in conformance with Sentences (3) and (4). (See Appendix A.)

3) Loudspeakers operated from the central alarm and control facility shall be tested to ensure they can be heard in all parts of the *building*.

4) The 2-way communication system from each *floor area* to the central alarm and control facility shall be tested to ensure proper operation.

**6.3.1.6. Repairs**

1) When a fire alarm and detection system, or part thereof, is shut off for repairs, or is inoperative for more than 2 h for any reason, the *owner* shall notify the fire department, and, when directed, provide a sufficient number of trained watchmen to patrol the *building* continually until the fire alarm and detection system is restored to operating condition.

2) Sentence (1) does not apply to industrial or manufacturing facilities maintaining their own industrial *fire brigades*.

3) Procedures acceptable to the *authority having jurisdiction* shall be developed to notify occupants if a fire or other emergency occurs when the fire alarm and detection system is shut down or inoperative.

**6.3.1.7. Audit**

1) When an existing fire alarm system has not been subjected to an initial verification as required by CAN/ULC-S524-M, "Installation of Fire Alarm Systems," and described in ULC-S537-M, "Verification of Fire Alarm Systems," the *authority having jurisdiction* may require the system to be audited in conformance with ULC-S536-M, "Inspection and Testing of Fire Alarm Systems," unless he is satisfied that the system has

been maintained and is functioning in a manner acceptable to the *authority having jurisdiction*.

**6.3.1.8. Signal Transmission**

1) Where a fire alarm or sprinkler system is required to transmit a signal to the fire department in conformance with the Alberta Building Code, such a connection shall be maintained at all times.

**6.3.1.9. Smoke Alarm Maintenance**

1) Except as provided in Sentence (2) the *owner* of a leased *dwelling unit* shall

- ensure *smoke alarms* within the *dwelling unit* are tested and cleaned prior to occupancy, and
- provide tenants information concerning ongoing *smoke alarm* testing and maintenance.

2) *Smoke alarms* in suites of residential occupancy are to be tested and cleaned every month.

3) Sentences (1) and (2) do not apply to a *dwelling unit* that is a mobile recreation vehicle or tent.

4) For hotels and motels, a record shall be kept of all tests and such records shall be retained for examination by the *authority having jurisdiction* in conformance with Article 1.1.1.2.

## Section 6.4. Standpipe and Hose Systems

**6.4.1. General****6.4.1.1. Inspection, Testing and Maintenance**

1) Except as provided in Sentences (2), (3) and (4), no person shall inspect, test, service or otherwise maintain a standpipe and hose system except in conformance with NFPA 25 "Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems." (See Appendix A.)

2) Valve handles, hose, couplings and nozzles attached to a standpipe and hose system and stored on racks, reels or in hose houses shall be inspected annually.

3) Hose referred to in Sentence (2) shall be service tested at intervals not exceeding

- 5 years from the date of purchase of the hose, and
- every 3 years thereafter, or
- whenever the hose is repaired.

## 6.4.1.2.

4) No person shall conduct an inspection or service test of hose, couplings or nozzles described in Sentences (2) and (3) except in conformance with NFPA 1962, "Care, Use, and Service Testing of Fire Hose Including Couplings and Nozzles."

### 6.4.1.2. Protection During Alteration or Demolition

1) During alteration or demolition of a *building* required to have a standpipe and hose system, the system shall be installed or dismantled progressively so as to provide protection to all *floor areas*.

### 6.4.1.3. Hose Stations and Cabinets

- 1) Hose stations and cabinets shall be
  - a) conspicuously identified in accordance with the Alberta Building Code,
  - b) maintained free of obstructions, and
  - c) inspected at intervals not greater than one month to ensure that
    - i) the hose is in proper position, and
    - ii) all the equipment is in place and in operable condition.

2) Hose cabinets shall be used for fire protection equipment only.

3) When a protective tamper proof device that covers the cabinet latching mechanism is used to prevent unauthorized access to the contents of the cabinet, such a device shall be acceptable to the *authority having jurisdiction*.

4) When a tamper proof device is installed in conformance with Sentence (3), hose stations and cabinets shall be inspected at least annually, or when the device has been removed or damaged.

### 6.4.1.4. Defects

1) Standpipe and hose systems having defects shall be repaired or replaced where necessary to ensure they will operate effectively and safely.

### 6.4.1.5. Tests after Alteration or Period of Disuse

1) Standpipe systems that have been modified or extended in conformance with Article 2.1.3.1. or are being restored to service after a period of disuse exceeding 12 months shall be flow and pressure tested at the highest and most remote hose connection to ensure the availability of the water supply for which the system was designed.

### 6.4.1.6. Flow Testing

1) Standpipe systems shall be flow tested at intervals not greater than 5 years to ensure that the design flow can be delivered. (See Appendix A.)

2) If during the flow test required in Sentence (1) there is any indication of the presence of debris in the piping, the entire system shall be flushed of foreign material.

### 6.4.1.7. Fire Department Connections

1) Signs provided to identify which fire department connection serves a particular sprinkler or standpipe system shall be maintained in conformance with Subsection 2.1.4.

2) Protective caps shall be kept in place at all times on fire department connections.

3) Where protective caps are missing, the fire department connections shall be examined for accumulated refuse, back flushed when conditions warrant, and the caps replaced.

- 4) When a standpipe and hose system or any portion thereof is out of service for any reason, the *owner* shall ensure that
- a) the fire department is notified in accordance with Article 6.1.1.3., and
  - b) a sign is posted on each fire department connection indicating what portion of the system is out of service.

### 6.4.1.8. Records

1) A record shall be kept of all tests required by this Section, and such records shall be retained for inspection by the *authority having jurisdiction*, in conformance with Article 1.1.1.2.

## Section 6.5. Automatic Sprinkler Systems

### 6.5.1. General

#### 6.5.1.1. Design and Installation

1) Except as otherwise provided in this Code, an automatic sprinkler system required by this Code shall be designed and installed in conformance with the Alberta Building Code. (See Appendix A.)

#### 6.5.1.2. Sprinkler Control Valves

1) Sprinkler control valves shall not be closed in the event of a fire until the fire is extinguished or is considered to be under control by other means, as determined by the fire department.

#### 6.5.1.3. Changes in Ambient Conditions

1) Changes in equipment or *occupancy* which might result in temperatures at sprinklers being above 38°C or below 4°C shall not be made without previously making provisions to alter the sprinkler system to prevent premature operation or freezing.

**6.5.1.4. Precautions against Freezing**

1) Sections of sprinkler systems subject to freezing shall be converted to dry pipe or antifreeze systems with a separate control valve for that part of the system.

**6.5.1.5. Obstructions**

1) No obstructions shall be placed so as to interfere with the effectiveness of water discharge from sprinklers. (See Appendix A.)

**6.5.1.6. Sprinkler Guards**

1) Sprinklers shall be protected by sprinkler guards where there is the possibility of mechanical damage.

**6.5.1.7. Protection of Combustible Sprinkler Piping**

1) Protection required by the Alberta Building Code for combustible sprinkler piping shall be maintained. (See Appendix A.)

**6.5.1.8. Signs**

1) Where a fire department connection to an automatic sprinkler system services only a specific area or zone in a *building*, a sign clearly identifying that specific area or zone shall be mounted in close proximity to the fire department connection.

2) Where a sectional control valve is installed it shall be located in an area acceptable to the fire department.

3) Where a sectional control valve is installed as described in Sentence (2), a clearly visible sign indicating its location and function shall be provided.

**6.5.2. Sprinkler System Shutdown****6.5.2.1. Repairs**

1) When a sprinkler system is temporarily shut down, it shall be returned to service in the shortest possible time.

**6.5.2.2. Restoration of Sprinkler Protection**

1) Full sprinkler protection shall be restored or the provisions of Article 6.1.1.4. maintained when work on the system is discontinued.

**6.5.2.3. Identification of Closed Valves**

1) Closed sprinkler control valves shall be clearly identified. (See Appendix A.)

**6.5.3. Testing****6.5.3.1. Testing**

1) Except as otherwise required in this Section, the testing and maintenance of sprinkler systems shall be in conformance with NFPA 25, "Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems."

2) Prior notification of waterflow or other tests to be made to a sprinkler system shall be given to all parties who could be affected by an alarm.

**6.5.3.2. Waterflow Alarm Tests**

1) Waterflow alarm tests using the inspector's test connection shall be performed on wet pipe sprinkler systems at intervals not greater than 12 months.

2) Except as provided in Sentence 6.5.3.4.(1) or except when the alarm line discharge is subject to freezing, waterflow alarm tests using the alarm test connection located at the sprinkler valve shall be performed on sprinkler systems at intervals not greater than one month.

**6.5.3.3. Records**

1) A record shall be kept of tests and operations of each system, and this record shall be retained for examination by the *authority having jurisdiction*, in conformance with Article 1.1.1.2.

**6.5.3.4. Electrical Supervisory Signal Testing**

1) Where an electrical supervisory signal service is provided for a sprinkler system, initiating and transmitting devices shall be tested in conformance with Sentences (2) and (3).

2) Transmitters and water flow actuated devices shall be tested at intervals not greater than 12 months.

3) Gate-valve supervisory switches, tank water level devices, *building* and tank water temperature supervisory devices and other sprinkler system supervisory devices shall be tested at intervals not greater than 12 months.

**6.5.3.5. Alterations to Sprinkler Systems**

1) After repairs or alterations are made to any sprinkler system

a) new system piping shall be pressure tested in conformance with Articles 6.5.3.8. to 6.5.3.10.,

b) a main drain test conforming to Article 6.5.3.11. shall be performed to ensure that all valves controlling water supply are fully opened, and

### 6.5.3.6.

- c) alarm and supervisory devices shall be checked to ensure that they will function properly.

#### 6.5.3.6. Flushing of Mains

1) Before connection is made between underground water mains and overhead sprinkler system piping, or after any work on underground piping or valves has taken place, underground mains and lead-in connections to sprinkler system risers shall be flushed for sufficient time to remove foreign material, and until the discharge water is clear, using a minimum water flow velocity of 3 m/s. (See Appendix A.)

#### 6.5.3.7. Pressure Testing of Underground Mains

1) Underground mains and connections shall be subjected to a 2 h hydrostatic pressure test of 350 kPa (gauge) in excess of the maximum static pressure, but not less than 1 400 kPa (gauge).

- 2) Leakage during the test required in Sentence (1) shall not exceed
- a) 2 L/h per 100 joints for pipe laid with rubber gasketed joints, and
  - b) 30 mL/h per inch of pipe diameter per joint for pipe laid with caulked lead or lead substitute joints.

#### 6.5.3.8. Pressure Testing of Sprinkler Systems

1) Except as permitted in Article 6.5.3.10., the sprinkler system shall be subjected to a hydrostatic pressure test of 1 400 kPa (gauge), or 350 kPa (gauge) in excess of the maximum static pressure to which the system may be subjected if in excess of 1 050 kPa (gauge), for a period of 2 h without loss of pressure.

#### 6.5.3.9. Dry-Pipe System Testing

1) For dry-pipe systems, the clapper of the differential dry-pipe valve shall be held off its seat and the ball drip in the intermediate chamber shall be replaced by a plug during the test.

#### 6.5.3.10. Danger of Freezing

1) When danger of freezing does not permit hydrostatic pressure testing, the sprinkler system shall be pressure tested with air at 350 kPa (gauge) for 2 h without loss of pressure.

2) When a sprinkler system has been tested in conformance with Sentence (1), it shall be tested again in conformance with Articles 6.5.3.7. and 6.5.3.8. as soon as hydrostatic pressure testing can be performed without danger of freezing.

#### 6.5.3.11. Main Drain Test

1) A main drain test shall be conducted at intervals not greater than 12 months to ensure that the water supply available to the sprinkler system has not deteriorated. (See Appendix A.)

2) Drainage facilities shall be tested to ensure that the drains are capable of taking the full flow from the main drain pipe without causing damage.

#### 6.5.3.12. Trip Testing of Dry-Pipe Valves

1) Dry-pipe valves shall be trip tested at intervals not greater than 12 months with the control valve partially open.

2) Dry-pipe valves shall be trip tested at intervals not greater than 3 years with the control valve fully open using the inspector's test valve.

#### 6.5.3.13. Alarm Testing

1) All mechanical and electrical alarms shall be tested to ensure that they are in operative condition.

#### 6.5.3.14. Defective Devices

1) If any device in a sprinkler system does not operate properly on test, it shall be repaired or replaced.

### 6.5.4. Maintenance

#### 6.5.4.1. Valve Inspections

1) Except as permitted in Sentences (2) and (3), valves controlling sprinkler water supplies or alarms shall be inspected at intervals not greater than 7 days to ensure that they are in the open position.

2) Valves which are locked open shall be inspected at intervals not greater than one month.

3) Valves which are electrically supervised shall be inspected at intervals not greater than 2 months.

#### 6.5.4.2. Accessibility and Operability

1) Sprinkler control valves shall be accessible and maintained in operable condition at all times.

#### 6.5.4.3. Pits

1) Pits containing sprinkler control valves shall be kept free of water and protected against freezing.

**6.5.4.4. Reopening of Control Valves**

1) After any sprinkler system control valve has been operated, a drain test shall be performed to ensure that the valve has been fully reopened. (See Appendix A.)

**6.5.4.5. Piping and Hangers**

1) Sprinkler piping and hangers shall be kept in good repair.

**6.5.4.6. Dry-Pipe Systems**

1) In addition to other requirements in this Part, dry-pipe automatic sprinkler systems shall be maintained in conformance with Articles 6.5.4.7. to 6.5.4.11.

**6.5.4.7. Air Pressure**

1) Air pressure on dry-pipe automatic sprinkler systems shall be read at intervals not greater than 7 days, and the system shall be maintained at the required pressure.

**6.5.4.8. Winter Drainage**

1) Auxiliary drains shall be drained before each winter.

**6.5.4.9. Protection against Freezing**

1) Dry-pipe valve rooms or enclosures in unheated *buildings* shall be inspected at intervals not greater than 24 h during periods of freezing weather and measures shall be taken to ensure that the temperature of the room or enclosure is maintained above 4°C.

**6.5.4.10. Priming Water Level**

1) The priming water for dry-pipe valves shall be maintained at the proper level.

**6.5.4.11. Test Flushing**

1) Except as provided in Sentence (2), dry-pipe systems shall be test flushed at intervals not greater than 15 years.

2) Whenever any of the regularly scheduled testing procedures required in Subsection 6.5.3. indicate the presence of possible obstructions in dry-pipe system piping, the entire system shall be flushed of foreign material.

**6.5.4.12. Sprinkler Inspection and Replacement**

1) Sprinklers shall be inspected at intervals not greater than 12 months for damage, corrosion or accumulations of grease, paint or other deposits and shall be replaced where such conditions would

impair the operation of the sprinkler. (See Appendix A.)

**6.5.4.13. Sprinkler Testing**

1) Sample sprinklers from sprinkler systems which have been in service for more than 50 years shall be sent to a recognized testing laboratory for testing, and this procedure shall be repeated at intervals not greater than 10 years thereafter.

2) When sprinklers are required to be tested in conformance with Sentence (1), no fewer than 6 sprinklers of each type shall be tested, except that no fewer than 2 sprinklers per floor per individual system shall be tested.

**6.5.4.14. Defective Sprinklers**

1) All sprinklers shall be replaced in sprinkler systems from which sample sprinklers have been tested and found defective.

**6.5.4.15. Spare Sprinklers**

1) Where sprinkler systems are installed, a supply of spare sprinklers and equipment shall be maintained in conformance with Sentences (2) to (5).

2) Spare sprinklers shall be kept in a cabinet located where the temperature will at no time rise above 38°C.

3) The stock of spare sprinklers to be kept on hand shall be as follows:

- a) for installations containing not more than 300 sprinklers, no fewer than 6 spare sprinklers,
- b) for installations containing from 301 to 1 000 sprinklers, no fewer than 12 spare sprinklers, and
- c) for installations containing more than 1 000 sprinklers, no fewer than 24 spare sprinklers.

4) Spare sprinklers shall correspond to the types and temperature ratings of the sprinklers in use.

5) A sprinkler wrench shall be kept in the cabinet where the spare sprinklers are stored.

**6.5.4.16. Fire Department Connections**

1) Fire department connections for sprinkler systems shall be maintained in conformance with Article 6.4.1.7.

## Section 6.6. Water Supply Systems for Fire Protection

### 6.6.1. General

#### 6.6.1.1. Maintenance

1) Water supplies for fire protection, including hydrants, shall be maintained so as to be capable of providing the flow and pressure of water for which they were designed.

#### 6.6.1.2. Valve Inspections

1) Valves controlling water supplies to fire protection systems shall be inspected at intervals not greater than 7 days to ensure that they are sealed or locked in the correct operating position.

#### 6.6.1.3. Ice Accumulations

1) Water supply systems for fire protection shall be kept free of ice accumulations.

#### 6.6.1.4. Antifreeze Solutions

1) Where antifreeze solutions are used to maintain pumping systems operable under freezing conditions, the specific gravity shall be such that the solution will remain unfrozen at a temperature not less than 8°C below the expected minimum temperature of the surrounding atmosphere.

#### 6.6.1.5. Internal Scale and Rust

1) Water supply piping systems shall be cleaned and flushed when necessary to remove deposits of scale or rust that reduce the flow of water below that for which the piping is designed.

### 6.6.2. Tanks

#### 6.6.2.1. Tank Inspections

1) Tanks for fire protection, tank supporting structures and water supply systems including piping, control valves, check valves, heating systems, mercury gauges and expansion joints shall be inspected at intervals not greater than 12 months to ensure that they are in satisfactory operating condition.

#### 6.6.2.2. Tank Heating Equipment

1) Tank heating equipment and accessories shall be inspected at intervals not greater than 24 h during freezing weather to ensure that they are in operating condition and that heater valves are open.

#### 6.6.2.3. Temperature Readings

1) The temperature of water contained in tanks shall be read at intervals not greater than 24 h during freezing weather and measures shall be taken to ensure that it does not fall below 4°C.

2) For tanks in *buildings* the temperature of the tank enclosure shall be read at intervals not greater than 24 h during freezing weather and measures shall be taken to ensure that the temperature of the water does not fall below 4°C.

#### 6.6.2.4. Sediment Accumulation and Corrosion

1) Tanks shall be inspected at intervals not greater than 2 years for sediment accumulations and for corrosion.

2) Accumulations of sediment found during inspections shall be removed.

3) Corroded iron or steel work shall be scraped and repainted as required.

#### 6.6.2.5. Cathodic Protection Equipment

1) *Cathodic protection* equipment installed to prevent corrosion of steel tanks shall be inspected and maintained at intervals not greater than 12 months.

#### 6.6.2.6. Inspection of Gravity Tanks

1) Gravity tanks shall be inspected at intervals not greater than 12 months to ensure that

- a) the tank roof is tight and in good repair,
- b) hatches or doors are kept closed and properly secured, and
- c) the frostproof casing of the tank riser makes a tight joint with the bottom of the tank.

2) Gravity tanks shall be overflowed at intervals not greater than one month to ensure that they are full.

#### 6.6.2.7. Housekeeping

1) Rubbish and waste materials shall not be permitted in

- a) the space between overflow pipes and the tops of gravity tanks,
- b) the valve pits at the bottoms of the risers, and
- c) the entire area around the bases of the columns of tanks.

#### 6.6.2.8. Expansion Joints

1) Gravity tank expansion joints shall be repacked and adjusted if binding or leaks develop.

**6.6.2.9. Inspection of Pressure Tanks**

- 1) Pressure tanks shall be inspected at intervals not greater than 7 days during which
  - a) the water level shall be observed, and
  - b) the pressure shall be read.
- 2) Water levels and pressure for pressure tanks shall be maintained at the specified levels.

**6.6.3. Fire Pumps and Reservoirs****6.6.3.1. Reservoirs**

- 1) The water level in the fire pump reservoir shall be observed at intervals not greater than 7 days and maintained at the proper level.

**6.6.3.2. Pump Room Temperature**

- 1) Measures shall be taken to ensure that the ambient air temperature in the pump room never falls below the minimum recommended by the engine manufacturer, or 4°C, whichever is higher. (See Appendix A.)

**6.6.3.3. Fire Pump Testing**

- 1) Except as provided in Sentence (2), fire pumps shall be operated at intervals not greater than 7 days at their rated speeds until the satisfactory performance of the pump, driver and controller is verified. (See Appendix A.)
- 2) For fire pumps that are driven by an electric motor, the tests described in Sentence (1) shall be performed at intervals not greater than one month.
- 3) Internal combustion engine fire pumps shall be operated for a sufficient time to bring the engines up to normal operating temperatures, and the storage batteries, lubrication systems, oil and fuel supplies shall be maintained at the correct levels.
- 4) Fire pumps shall be tested at full rated capacity at intervals not greater than 12 months to ensure that they are capable of delivering the rated flow.

5) *Storage tanks* shall be drained and refilled in conformance with Article 6.7.1.5.

6) Tests required by Sentence (4) shall be conducted in conformance with NFPA 25, "Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems."

**6.6.3.4. Records**

- 1) Records shall be kept of all fire pump tests, and such records shall be retained for examination by the *authority having jurisdiction*, in conformance with Article 1.1.1.2.

**6.6.4. Hydrants****6.6.4.1. Maintenance**

- 1) Hydrants shall be maintained in operating condition.
- 2) Hydrants shall be kept readily accessible for fire fighting use and their locations shall be clearly identified.

**6.6.4.2. Inspection Frequency**

- 1) Hydrants shall be inspected at intervals not greater than 6 months and after each use in conformance with Article 6.6.4.4.

**6.6.4.3. Records**

- 1) Records of inspections and tests required in Article 6.6.4.2. shall be retained for examination by the *authority having jurisdiction*, in conformance with Article 1.1.1.2.

**6.6.4.4. Inspections and Repairs**

- 1) Hydrants shall be inspected to ensure that hydrant caps are in place and caps with worn, rusted or obstructed threads, which might hamper easy removal, shall be repaired or replaced.
- 2) Hydrant barrels shall be inspected to determine if water has accumulated as a result of a leaking main valve or a plugged or damaged drain valve.
- 3) Except as provided in Sentence (4), main valves which are leaking and drain valves which are plugged or damaged shall be repaired.
- 4) Where it is not practical to repair faulty drain valves or where drain valves are intentionally plugged, measures shall be taken to prevent the freezing of accumulated water.
- 5) When a hydrant is shut down for repairs or alteration, it shall be identified in a manner acceptable to the *authority having jurisdiction*.

**6.6.4.5. Annual Flushing**

- 1) Hydrants shall be flushed at intervals not greater than 12 months with the main valve and any outlet valves fully opened until the water runs clear.

## Section 6.7. Emergency Power Systems and Unit Equipment for Emergency Lighting

### 6.7.1. General

#### 6.7.1.1. Inspection, Testing and Maintenance

1) Except as provided in Articles 6.7.1.2. to 6.7.1.5., emergency power systems shall be inspected, tested and maintained in conformance with CAN/CSA C282-M, "Emergency Electrical Power Supply for Buildings."

#### 6.7.1.2. Notification

1) When an emergency power system or any part thereof is shut down, the *supervisory staff* shall be notified in conformance with Section 2.8.

#### 6.7.1.3. Instructions

1) Where an emergency power system is installed, instructions shall be provided for switching on essential loads and for starting the generator when this is not done automatically.

#### 6.7.1.4. Records

1) Written records shall be maintained as required in CAN/CSA C282-M, "Emergency Electrical Power Supply for Buildings."

#### 6.7.1.5. Supply of Fresh Fuel

1) Liquid fuel *storage tanks* shall be drained and refilled with fresh fuel at intervals not greater than 12 months. (See Appendix A.)

#### 6.7.1.6. Inspection of Unit Equipment

1) Self-contained emergency lighting unit equipment shall be inspected at intervals not greater than one month to ensure that

- a) pilot lights are functioning and not obviously damaged or obstructed,
- b) the terminal connections are clean, free of corrosion and lubricated when necessary,
- c) the terminal clamps are clean and tight as per manufacturer's specifications,
- d) the battery surface is kept clean and dry, and
- e) the emergency light heads are aligned in an acceptable manner.

2) Self-contained emergency lighting unit equipment shall be tested

- a) at intervals not greater than one month to ensure that the emergency lights will

function upon failure of the primary power supply, and

- b) at intervals not greater than 12 months to ensure that the unit will provide emergency lighting for a duration equal to the design criterion under simulated power failure conditions.

3) After completion of the test required in Clause (2)(b), the charging conditions for voltage and current and the recovery period shall be tested to ensure that the charging system is functioning in accordance with the manufacturer's specifications.

#### 6.7.1.7. Inspection of Emergency Lights

1) Except as provided in Article 6.7.1.6., emergency lights shall be inspected at intervals not greater than 12 months to ensure that they are functional.

## Section 6.8. Special Fire Suppression Systems

### 6.8.1. General

#### 6.8.1.1. Standards

(See Appendix A.)

1) Except as otherwise provided in this Section, where a special fire suppression system is required to be installed, the design and installation of the system shall conform to the following:

- a) NFPA 11, "Low Expansion Foam and Combined Agent Systems,"
- b) NFPA 11A, "Medium and High Expansion Foam Systems,"
- c) NFPA 12, "Carbon Dioxide Extinguishing Systems,"
- d) NFPA 12A, "Halon 1301 Fire Extinguishing Systems,"
- e) NFPA 12B, "Halon 1211 Fire Extinguishing Systems,"
- f) NFPA 15, "Water Spray Fixed Systems for Fire Protection,"
- g) NFPA 16, "Deluge Foam-Water Sprinkler and Foam-Water Spray Systems,"
- h) NFPA 17, "Dry Chemical Extinguishing Systems,"
- i) NFPA 17A, "Wet Chemical Extinguishing Systems,"
- j) NFPA 18, "Wetting Agents," or
- k) NFPA 2001, "Clean Agent Fire Extinguishing Systems."

2) Except as otherwise provided in this Section, where a special fire suppression system has been installed, inspection, testing and maintenance shall be provided in conformance with the appropriate standard listed in Sentence (1).

3) Where time intervals for maintenance and inspection are not specified in the appropriate standard in Sentence (1), inspection and maintenance routines shall be carried out at intervals not greater than 6 months.

#### 6.8.1.2. Records

1) Written records shall be kept of all periodic tests carried out in conformance with Article 6.8.1.1., and such records shall be retained for examination by the *authority having jurisdiction*, in conformance with Article 1.1.1.2.

#### 6.8.1.3. Instructions

1) Operating and maintenance instructions shall be posted in proximity to the equipment and shall be located near manual controls when such controls are provided.

#### 6.8.1.4. Identification

1) Valves and controls shall be marked to clearly indicate their function and shall be accessible at all times.

#### 6.8.1.5. Container Maintenance

1) Extinguishing agent containers provided for special fire suppression systems shall be fully charged with the proper quantity of extinguishing agent and the necessary operating pressure shall be maintained.

#### 6.8.1.6. Discharge Outlets

1) Discharge outlets for special fire suppression systems shall be kept free of dirt and residue.

#### 6.8.1.7. Piping

1) Piping and equipment shall be mechanically secure and accessible for cleaning and maintenance.

#### 6.8.1.8. Replacement Equipment

1) Replacement equipment and devices provided for special fire suppression systems shall meet the original design criteria for the installation in which they are to be placed.

#### 6.8.1.9. Change in Hazard

1) An increase in a hazard for which a special fire suppression system has been designed is not permitted unless the level of fire protection is increased commensurate with the increased hazard.

## Section 6.9. Hose for Firefighting

### 6.9.1. General

#### 6.9.1.1. General

1) No person shall sell, offer for sale, purchase, lease or otherwise distribute hose couplings or fittings intended for use on fire fighting hose by a municipal fire department or *fire brigade* unless the couplings and fittings comply with this Section.

2) Threaded fire fighting hose couplings and fittings shall have threads that are

- 38 mm Straight Iron Pipe Thread (S.I.P.T.) on 38 mm couplings, or
- 3.15 threads per cm with a major thread diameter between 75.95 mm and 75.69 mm for male threads and 76.45 mm for female threads on 65 mm couplings

3) All fire fighting hose couplings shall meet the test requirements of ULC-S513, "Threaded Couplings for 1 1/2 inch and 2 1/2 inch Fire Hose," for pull, compression, hardness, and corrosion resistance.

4) All fire fighting hose with internal lug quick-connect couplings shall be in conformance with CAN4-S543, "Internal Lug Quick-connect Couplings for Fire Hose."

## Section 6.10. Lightning Protection Systems

### 6.10.1. General

#### 6.10.1.1. Compliance

1) No person shall sell, offer for sale, install or maintain lightning protection systems unless the person complies with this Section.

#### 6.10.1.2. Installation

1) A person who installs a lightning protection system shall ensure that the installation conforms to CAN/CSA-B72, "Installation Code for Lightning Protection Systems."

### 6.10.2. Qualifications

#### 6.10.2.1. Qualifications

1) Sentence 6.1.1.6.(1) does not prevent a qualified person from using unskilled persons to assist with the installation of lightning protection

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### 6.10.3.1.

systems if the qualified person oversees the installation and is satisfied before issuing the certificate of installation required by Article 6.10.4.1. that the installation complies with the Code.

## 6.10.3. Materials

### 6.10.3.1. Materials

- | 1) A person who sells, offers for sale, installs or maintains lightning protection systems shall provide the *Administrator*, Fire Discipline with
- a) samples of lightning protection materials used, or proposed to be used, sold, offered for sale or installed, and
  - b) samples of materials indicated in Clause (a), should new or different materials be contemplated.

### 6.10.3.2. Installation Methods

- | 1) The *Administrator*, Fire Discipline may, at any time, require that a person referred to in Sentence 6.10.3.1.(1) supply information, including samples of material if necessary, that explain the method of installation used when installing lightning protection systems.

## 6.10.4. Certificates

### 6.10.4.1. Certificates

- | 1) A person who installs lightning protection systems shall within 30 days after the date the installation is completed, send a certificate of installation to
- a) the person for whom the installation was carried out, and
  - b) the *authority having jurisdiction*.

# Part 7

## Fire Emergency Systems in High Buildings

### Section 7.1. General

#### 7.1.1. General

##### 7.1.1.1. Application

1) This Part provides for the inspection, testing and maintenance of the fire emergency systems installed in high *buildings* as defined in Subsection 3.2.6. of the Alberta Building Code.

##### 7.1.1.2. Testing Fire Emergency Systems

1) Except as provided in Sentence (2), fire emergency systems required to be installed in *buildings* in conformance with Subsection 3.2.6. of the Alberta Building Code shall be tested in conformance with Sections 7.2. and 7.3.

2) Any fire emergency system required by Subsection 3.2.6. of the Alberta Building Code that does not conform to a specific measure outlined in Chapter 3 of the Supplement to the National Building Code of Canada 1990 shall be tested to ensure that it operates as intended.

3) Deficiencies noted during the testing described in Sentences (1) and (2) shall be corrected.

##### 7.1.1.3. Records

1) A written record shall be kept of all tests and corrective measures required by Article 7.1.1.2., and such record shall be retained for examination by the *authority having jurisdiction*, in conformance with Article 1.1.1.2.

##### 7.1.1.4. Maintenance of Fire Emergency Systems

1) In addition to the requirements of Part 6, components of fire emergency systems shall be maintained in conformance with Sentences (2) to (5).

2) The keys required to recall elevators and to permit independent operation of each elevator shall be kept in the locations required by Sentence 2.5.1.3.(1).

3) Access to windows and panels required to vent *floor areas* and vents to vestibules permitted to be manually openable shall be kept free of obstruction.

4) Windows and panels provided for venting *floor areas* shall be maintained so as to be openable without the use of keys.

5) Vents to vestibules permitted to be manually openable shall be maintained in an operable condition.

6) The fire fighters' elevator identification required in Subsection 3.2.6. of the Alberta Building Code shall be maintained in a condition acceptable to the fire department.

### Section 7.2. Inspection, Testing and Maintenance

#### 7.2.1. Intervals between Tests

##### 7.2.1.1. Intervals between Tests

1) Except as specifically prescribed in this Part, all tests specified in this Section and Section 7.3. shall be carried out at intervals not greater than 3 months, except that longer intervals between tests are permitted in conformance with Part 1. (See Appendix A.)

#### 7.2.2. Elevators

##### 7.2.2.1. Testing Elevators

1) Elevator door-opening devices operated by means of photo-electric cells shall be tested to ensure that the devices become inoperative after the door has been held open for more than 20 s with the photo-electric cell covered.

2) Key-operated switches located outside an elevator shaft, and intended for firefighter use shall be identified in a manner acceptable to the fire department and tested to ensure that

- a) in the "Off" position, the elevators will operate normally, even if the fire alarm is activated,
- b) in the "Auto" position, activation of the fire alarm system will
  - i) render any security or service lock-out features, and the emergency stop switch inoperative as soon as

## 7.2.2.2.

- the doors are closed and the car starts to move,
- ii) cancel all other calls, and
- iii) cause the cars to proceed non-stop to the recall level where the car doors will open and remain open,
- c) in the "On" position, the elevator will respond as specified in Clause (2)(b) without the fire alarm being activated,
- d) neither the "Auto" or "On" position will override the elevator inspection mode, and
- e) the key can be removed from the key slot in any position.

3) Key-operated switches, in each elevator car, that are intended for fire fighter use, shall be identified in a manner acceptable to the fire department and tested to ensure that when in the "On" position

- a) the key can be removed from the key slot,
- b) the power-operated doors will only open or close when the appropriate button is continuously depressed; premature release will cause the doors to automatically return to their previous position, and
- c) the elevator will travel to the selected floor and will remain on that floor with its doors closed until the open button is pushed or an alternate floor is chosen.

4) Key or push button operated switches, located outside the elevator cars, that select an elevator or group of elevators to operate on emergency power, shall be identified in a manner acceptable to the fire department and tested to ensure that during a power failure

- a) the pre-selected elevator or group of elevators will operate normally, and
- b) operation of the switches will transfer power to another elevator or group of elevators as indicated by the labelled switch position.

5) At intervals not greater than 12 months, the *building* emergency power systems shall be operated and all elevators supplied with emergency power shall be tested with no other source of electrical power.

### 7.2.2.2. Tests

1) The tests specified in this Subsection shall be carried out at intervals of not more than 1 year.

## 7.2.3. Venting to Aid Fire Fighting

### 7.2.3.1. Closures

1) The *closures* in vent openings into smoke shafts from each *floor area* shall be tested at intervals in conformance with Article 7.2.1.1. to ensure that

- a) they can be operated from a remote location such as a stairshaft, the *storey* immediately below or the central alarm and control facility, and
- b) they will not open automatically on any *storey* other than the fire floor when smoke or hot gas passes through the shaft.

2) Sentence (1) does not require all *closures* in vent openings into smoke shafts to be tested on each test occasion, but a representative number may be tested at any one time provided the test, the number of closures and sequence is acceptable to the *authority having jurisdiction*.

### 7.2.3.2. Elevator Recall

1) In addition to the procedures described in Article 7.2.3.1., all elevators in an elevator shaft that is designed for use as a smoke shaft shall be tested to ensure that on activation of the fire alarm system they will return to the *street* floor level and remain inoperative.

### 7.2.3.3. Air-Handling System Controls

1) Controls for air-handling systems used for venting in the event of a fire shall be tested to ensure that

- a) the system can maintain an exhaust to the outdoors at a rate of six air charges per hour from any *floor area*, and
- b) emergency power to the fans required by Clause (a) is provided as described in Article 3.2.7.9. of the Alberta Building Code.

### 7.2.3.4. Records

(See Appendix A.)

1) A written record shall be kept of all tests and corrective measures required by this Subsection and such record shall be retained for examination by the *authority having jurisdiction*, in conformance with Article 1.1.1.2.

## 7.2.4. Central Alarm and Control Facility

### 7.2.4.1. Fan Controls

1) Air moving fans in a system serving more than 2 *storeys* shall be tested to ensure that they will stop on activation of a switch at the central alarm and control facility.

### 7.2.4.2. Hold-Open Devices

1) Doors to vestibules that are normally held open by a hold-open device connected to the *building* fire alarm system shall be tested to ensure

that they will close on a signal from the central alarm and control facility.

- f) doors to vestibules, if normally held open, will close automatically and remain closed.

## Section 7.3. Inspections and Test Procedures for Smoke Control Measures

### 7.3.1. General

#### 7.3.1.1. Application

1) The test procedures described in Subsection 7.3.2., as appropriate to the fire safety measure being used, shall be carried out in addition to those required by Sections 7.1. and 7.2., unless other arrangements acceptable to the *authority having jurisdiction* are included in the fire safety plan. (See Appendix A.)

#### 7.3.1.2. Doors in Means of Egress

1) Where vestibules or stairshafts are pressurized as a means of smoke control, all doors in the path of *exit* travel shall be tested to ensure that they can be operated as required in Article 2.7.2.1. when the entire smoke control system is being tested.

#### 7.3.1.3. Records

1) A written record shall be kept of all tests and corrective measures required by Subsection 7.3.2., and such record shall be retained for examination by the *authority having jurisdiction*, in conformance with Article 1.1.1.2.

### 7.3.2. Smoke Control Equipment

#### 7.3.2.1. Central Alarm and Control Facility

1) Where applicable, switches at the central alarm and control facility shall be tested at intervals conforming to Article 7.2.1.1. to ensure that

- a) closures to vent openings in vertical service spaces, elevator shafts, smoke shafts, stairshafts and outdoors in vestibules and below grade floor areas will operate as designed,
- b) pressurization, exhaust, and supply air fans for vestibules, elevator shafts, stairshafts, and *floor areas*, including refuge areas will operate as designed,
- c) dampers in air-handling systems that serve more than 2 *storeys* will close automatically and remain closed,
- d) dampers in return air and exhaust ducts will operate as designed,
- e) *closures* in openings in the walls and roofs of the central core will close automatically and remain closed, and

2) A light or other indicator at the control panel will be deemed sufficient indication that the equipment functioned as intended except that at least once in every three year period, all equipment shall be confirmed by actual observation. (See Appendix A.)

#### 7.3.2.2. Pressurization

1) Pressurized vestibules, elevator and stair shafts, core areas, and areas of refuge shall be tested using pressure sensors or by tracer smoke

- a) at not more than 2 year intervals, and
- b) after any alterations to the *building* that may affect pressurization or air movement contrary to the original design element.



# Appendix A

## Explanatory Material for the Alberta Fire Code 1997

**A-1.1.2.3.** This requirement is intended as a means for the authority having jurisdiction to accept an arrangement, such as an existing building or fire protection system, that is not exactly identical to that required by the Code, but that is considered to provide an equivalent level of fire and life safety due to its specific qualities. This Code contains references to the Alberta Building Code (ABC) for the design, construction and installation of many fire protection features. Some ABC requirements are most readily applied to new buildings and their retroactive application to existing situations as prescribed by this Code could result in some difficulty in achieving compliance. It is the intent of this Code that an equivalent level of safety be achieved rather than necessarily achieving strict conformance to the ABC. The application of this Code to the upgrading of existing facilities should be based on the judgement of the enforcement authority, who must deal with each case on its merits. This Code states that the owner or the owner's authorized agent is responsible for carrying out the provisions of the Code. However, the owner is expected to communicate with the authority having jurisdiction, who is in a position to assess the relative significance of variances from the ABC requirements. Such authority may then determine that upgrading measures are not necessary, on the basis that the existing arrangement represents an equivalent level of fire and life safety. This Code presumes that the adopting legislation provides for the exercise of the necessary discretionary judgement on the part of the enforcing officials, along with appropriate rights to appeal. See also Appendix Note A-2.1.3.1.(1).

**A-1.1.3.3.(2)** Documents referenced in this Appendix shall be the editions designated in Table A-1.1.3.3.

### **A-1.2.1.2.(1) Authority having jurisdiction.**

The defined term "authority having jurisdiction" refers to a safety codes officer as the appointed individual responsible for decision making in a number of areas. In most cases, this individual will be a member of an accredited municipal fire department. In municipalities that use accredited agencies for their inspection and enforcement the fire department may not be involved. It is important that both accredited municipalities and non-accredited municipalities employing accredited agencies properly designate the person(s) acting as the authority having jurisdiction. In addition, municipalities using accredited agencies should ensure that the agency have a close working relationship with the fire department during the decision making process.

**A-1.2.1.2.(1) Exit.** Exits include doors or doorways leading directly into an exit stair or directly to the outside. In the case of an exit leading to a separate building, exits also include vestibules, walkways, bridges or balconies.

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The Appendix to this document is included for explanatory purposes only and does not form part of the requirements. The reference numbers that introduce each item apply to the requirements in the Code.

## A-1.2.1.2.(1)

**Table A-1.1.3.3.**  
**Documents Referenced in Appendix A of the Alberta Fire Code 1997 (AFC)**

Issuing Agency	Document Number	Title of Document	Code Reference
ACGIH		Industrial Ventilation: A Manual of Recommended Practice, 21st Edition	A-3.2.7.3.(1)(b)
API	2000-1992	Venting Atmospheric and Low-Pressure Storage Tanks	A-4.3.12.8.(1)
API	2013-1991	Cleaning Tank Vehicles Used for the Transportation of Flammable Liquids	A-4.11.2.6.
API	2015-1994	Cleaning Petroleum Storage Tanks	A-4.10.4.1.
ASTM	D 5-95	Penetration of Bituminous Materials	A-4.1.3.1.
ASTM	D 3278-96	Flash Point of Liquids by Setaflash Closed-Cup Apparatus	A-4.1.3.1.
CGAI	CGA P-1(1991)	Safe Handling of Compressed Gases in Containers	A-3.1.1.4.(1)(a)
CGA	CAN/CGA-B149.5-M95	Installation Code for Propane Fuelled Systems and Tanks on Highway Vehicles	A-2.4.4.5.(1)
CSA	CAN/CSA-B72-M87	Installation Code for Lighting Protection Systems	A-6.1.1.6.(1)
CSA	CAN/CSA-B139-M91	Installation Code for Oil Burning Equipment	A-4.1.1.1.(3)(b)
CSA	CAN/CSA-Z731 1995	Emergency Planning for Industry	A-5.1.5.1.(5)
CSA	PLUS 2203 HAZLOC-94	Hazardous Locations: A Guide for the Design, Construction and Installation of Electrical Equipment	A-4.1.4.1.(1)
FMEC	Data Sheet 7-50 (1989)	Compressed Gases in Cylinders	A-3.2.8.2.(2)
FMEC	Data Sheet 8-8 (1990)	Distilled Spirits Storage	A-3.2.3.3.(4)
Govt. of Alberta		Alberta Building Code 1997	A-1.1.2.3. A-1.2.1.2.(1) A-2.1.2.1.(1) A-2.1.3.1.(1) A-2.1.3.3.(4) A-2.7.1.3.(1) A-2.7.1.4.(2) A-2.7.3.1.(1) A-2.9.3.5.(1) A-3.2.2.3.(6) A-3.2.7.9.(1) A-3.2.7.12.(3) A-4.1.7.1.(1) A-4.2.7.5.(2) A-4.3.12.1.(2) A-5.4.3.1.(1) A-6.1.1.2.(1) A-6.5.1.1.(1) A-6.5.1.7.(1)
Govt. of Alberta		Occupational Health and Safety Act and its Regulations	A-3.2.7.13.(1)
Govt. of Alberta		Safety Codes Act	A-4.1.6.2.(2) A-4.9.3.3.(1) A-5.1.2.1.(1)

**Table A-1.1.3.3. (Continued)**

Issuing Agency	Document Number	Title of Document	Code Reference
HC		Workplace Hazardous Materials Information System (WHMIS) of the Hazardous Products Act	A-3.2.7.6.(2) A-3.2.7.13.(1)
HC		Consumer Chemicals and Containers Regulations of the Hazardous Products Act	A-3.2.5.2.(1)
HC		Controlled Products Regulations of the Hazardous Products Act	A-3.2.5.2.(1)
NFPA	10-1994	Portable Fire Extinguishers	A-6.2.1.2.(1)
NFPA	13-1996	Installation of Sprinkler Systems	A-3.2.3.3.(4) A-6.5.1.1.(1) A-6.5.1.5.(1)
NFPA	14-1996	Installation of Standpipe and Hose Systems	A-6.4.1.1.(1) A-6.4.1.6.(1)
NFPA	25-1995	Testing and Maintenance of Water-Based Fire Protection Systems	A-6.4.1.1.(1)
NFPA	30-1996	Flammable and Combustible Liquids Code	A-4.1.1.1.(2) A-4.1.3.1. A-4.1.4.1.(1) A-4.2.7.7.(1)
NFPA	30B-1994	Manufacture and Storage of Aerosol Products	A-3.2.5.2.(1)
NFPA	36-1993	Solvent Extraction Plants	A-4.1.1.1.(2)
NFPA	49-1994	Hazardous Chemicals Data	A-6.2.2.1.(1)
NFPA	61-1995	Prevention of Fires and Dust Explosions in Agricultural and Food Products Facilities	A-5.3.1.3.(2)
NFPA	65-1993	Processing and Finishing of Aluminum	A-5.3.1.3.(2)
NFPA	80A-1996	Exterior Fire Exposures	A-2.4.1.1.(5)
NFPA	91-1995	Exhaust Systems for Air-Conveying of Materials	A-5.3.1.3.(2)
NFPA	120-1994	Coal Preparation Plants	A-5.3.1.3.(2)
NFPA	231-1995	General Storage	A-3.2.1.1.(1)(a) A-3.2.2.4.(3) A-3.2.3.3.(4)
NFPA	327-1993	Standard Procedures for Cleaning of Safeguarding Small Tanks and Containers	A-4.10.4.1. A-4.11.2.6.
NFPA	480-1993	Storage, Handling and Processing of Magnesium	A-5.3.1.3.(2)
NFPA	481-1995	Production, Processing, Handling and Storage of Titanium	A-5.3.1.3.(2)
NFPA	482-1996	Production, Processing, Handling and Storage of Zirconium	A-5.3.1.3.(2)
NFPA	497A-1992	Classification of Class I Hazardous Locations for Electrical Installations in Chemical Process Areas	A-4.1.4.1.(1)
NFPA	650-1990	Pneumatic Conveying Systems for Handling Combustible Materials	A-5.3.1.3.(2)

## A-1.2.1.2.(1)

**Table A-1.1.3.3. (Continued)**

Issuing Agency	Document Number	Title of Document	Code Reference
NFPA	651-1993	Manufacture of Aluminum and Magnesium Powder	A-5.3.1.3.(2)
NFPA	654-1994	Prevention of Fires and Dust Explosions in the Chemical, Dye, Pharmaceutical and Plastics Industries	A-5.3.1.3.(2)
NFPA	655-1993	Prevention of Sulfur Fires and Explosions	A-5.3.1.3.(2)
NFPA	664-1993	Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities	A-5.3.1.3.(2)
NFPA	701-1996	Fire Tests for Flame-Resistant Textiles and Films	A-2.3.2.2.(1)
NFPA	1231-1993	Water Supplies for Suburban and Rural Firefighting	A-3.3.2.16.(1)(b)
OCIMF		Purchasing, Manufacturing and Testing of Loading and Discharge Hoses for Offshore Moorings, 4th Edition	A-4.7.8.1.(1)(a)
RMA		Hose Handbook, Fifth Edition	A-4.7.8.1.(1)(a)
TC		Transportation of Dangerous Goods Act and its Regulations (TDGR)	A-3.2.7.6.(2) A-3.2.7.13.(1) A-4.1.2.1. Table A-4.1.2.1. A-4.2.2.3.(2)
TC		Oil Pollution Prevention Regulations of the Canada Shipping Act	A-4.7.8.1.(1)(a)
ULC	CAN/ULC-S109-M87	Flame Tests of Flame-Resistant Fabrics and Films	A-2.3.1.3.(2)
ULC	CAN/ULC-S603-92	Steel Underground Tanks for Flammable and Combustible Liquids	A-4.3.10.1.
ULC	CAN4 S603(A) 92	Refurbishing of Steel Underground Tanks for Flammable and Combustible Liquids	A-4.3.8.3.(2)
ULC	CAN/ULC-S603.1-92	Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids	A-4.3.9.3.(2)
ULC	CAN4 S615(A) 87	Refurbishing of Reinforced Plastic Underground Tanks for Petroleum Fuels	A-4.3.8.3.(2)
ULC	CAN/ULC-S633-M90	Standard for Flexible Underground Hose Connectors	A-4.3.8.1.(6)(b)
ULC	ULC/ORD-C58.9-1993	Secondary Containment Liners for Underground and Aboveground Flammable and Combustible Liquid Tanks	A-4.3.8.1.(6)(b)
ULC	ULC/ORD-C58.12-1992	Leak Detection Devices for Underground Flammable Liquid Storage Tanks	A-4.3.8.1.(6)(e)
ULC	ULC/ORD-C107.7-1993	Glass Fibre Reinforced Plastic Pipe and Fittings for Flammable and Combustible Liquids	A-4.3.8.1.(6)(b)
ULC	ULC/ORD-C107.12-1992	Line Leak Detection Devices for Flammable Liquid Piping	A-4.3.8.1.(6)(f)
ULC	ULC/ORD-C107.19-1992	Secondary Containment of Underground Piping for Flammable and Combustible Liquid	A-4.3.8.1.(6)(b)

**A-1.2.1.2.(1) Fire separation.** A fire separation may or may not have a fire resistance rating.

**A-1.2.1.2.(1) Individual storage area.** The width of subsidiary aisles providing access to stored products within an individual storage area may be determined by material handling methods, or other criteria such as minimum width for access to exits or fire protection equipment.

**A-1.2.1.2.(1) Service room.** Typical examples of service rooms include boiler rooms, furnace rooms, incinerator rooms, garbage handling rooms and rooms to accommodate air-conditioning or heating appliances, pumps, compressors and electrical equipment. Rooms such as elevator machine rooms and common laundry rooms are not considered to be service rooms.

**A-1.2.1.2.(1) Suite.** Tenancy in the context of the term “suite” applies to both rental and ownership tenure. In a condominium arrangement, for example, dwelling units are considered separate suites even though they are individually owned. In order to be of complementary use, a series of rooms that constitute a suite are in reasonably close proximity to each other and have access to each other either directly by means of a common doorway or indirectly by a corridor, vestibule or other similar arrangement.

The term “suite” does not apply to rooms such as service rooms, common laundry rooms and common recreational rooms that are not leased or under a separate tenure in the context of the Code. Similarly, the term “suite” is not normally applied in the context of buildings such as schools and hospitals, since the entire building is under a single tenure. A rented room in a nursing home could be considered as a suite if the room was under a separate tenure. A hospital bedroom on the other hand is not considered to be under a separate tenure, since the patient has little control of that space, even though he pays the hospital a per diem rate for the privilege of using the hospital facilities, which include the sleeping areas.

For certain requirements in the ABC the expression “room or suite” is used (e.g., travel distance). This means that the requirement applies within the rooms of suites as well as to the suite itself and to rooms that may be located outside the suite. In other places the expression “suite, and rooms not located within a suite” is used (e.g., for the installation of smoke and heat detectors). This means that the requirement applies to individual suites as defined, but not to each room within the suite. The rooms “not within a suite” would include common laundry rooms, common recreational rooms and service rooms, that are not considered as tenant occupied space.

**A-2.1.2.1.(1)** The ABC 1990 introduced changes to the method of determining building height. Application of the current method to existing buildings for the purposes of this Code could result in certain buildings being reclassified as higher buildings. For this reason, the AFC suggests that building height is that which was established by the building code that was applicable at the time of construction in the case of original construction, or at the time of alteration if additional storeys have been added to the building.

**A-2.1.2.2.(1)** Arena-type buildings are often used for events such as community dances, rallies and trade shows. These events may increase the occupant and fuel loads beyond that for which the space was designed. To ensure safety during such events, additional egress facilities may be required to compensate for the additional occupant load and, in some cases, additional fire suppression measures may be required to compensate for the increased fuel load.

Large public corridors in mercantile occupancies are also used on a temporary basis for community activities, merchandising and for special displays. In these cases, additional egress facilities and fire suppression may be needed, depending on the increase in hazard.

**A-2.1.3.1.(1)** The ABC is most often applied to existing buildings when an owner wishes to rehabilitate a building, change its use, or build an addition; or when an enforcement authority decrees that a building, or a class of buildings, be altered for reasons of public safety. It is not intended that either the ABC or the AFC be used to enforce the retrospective application of new requirements in the ABC to existing buildings. Although the AFC could be interpreted to require the installation of fire alarm, standpipe and hose and automatic sprinkler systems in an existing building for which there were no requirements before the ABC was issued, it is the intent of the Fire Technical Council that the AFC not be applied in this manner to these buildings.

It is usually difficult to change structural features of an existing building when undertaking alterations or additions, but installation of “active” fire protection systems, such as alarms, sprinklers and standpipes, in existing buildings may be possible. These systems may be considered as contributing to an adequate degree of life safety in cases where the structural features of a building do not conform to the ABC.

Sentence 2.1.3.1.(1) is intended to address the installation of fire alarm, sprinkler and standpipe systems in existing buildings presently not so equipped, and in existing buildings that do not provide an acceptable level of safety to meet the current installation standards specified in the ABC. It is not intended that existing fire protection

## A-2.1.3.3.(4)

systems that provide an acceptable level of life safety be upgraded with each new edition of the ABC or in conjunction with the inclusion of new requirements not in force at the time that a building was constructed. The authority having jurisdiction is expected to use discretion in enforcing this requirement. The authority having jurisdiction may accept alternatives to strict compliance with the ABC as provided for in Sentence 1.1.2.3.(1) and as clarified in Appendix Note A-1.1.2.3.

**A-2.1.3.3.(4)** It is not the intent of this Sentence to restrict the use of battery operated smoke alarms that are installed in addition to required smoke alarms in the buildings listed. The requirements ensure that properties constructed after July 5, 1977 are protected by smoke alarms, with permanent connections to an electrical circuit, installed in accordance with the ABC.

**A-2.3.1.3.(2)** Some authorities having jurisdiction have incorrectly interpreted this Sentence to mean that natural Christmas trees are not allowed in any Group A or Group B occupancy. The intent of this Sentence is to ensure that festive decorations, which include Christmas trees, are sufficiently "flame-resistant" so as not to constitute a fire hazard in occupancies where large numbers of persons gather or are incapacitated.

Festive decorations, including Christmas trees (natural or artificial), that are to be used in any Group A or Group B occupancy are to be resistant to flame either inherently or by the application of approved flame retardant materials which comply with CAN/ULC-S109M, "Flame Tests of Flame-Resistant Fabrics and Films." Natural Christmas trees are considered to be inherently "flame resistant" if freshly cut and the base is kept in fresh water. A freshly cut tree is one that has been harvested within fourteen days. The tree must be removed from a Group A or Group B occupancy within the fourteen day time period. Fresh Christmas trees of all common varieties present no significant fire hazard. A fresh tree is one that has not lost an appreciable amount of its natural moisture. However, when dry, Christmas trees are among the most flammable items in a home. Once ignited, the speed and intensity of burning is extreme. A dry tree will appear to explode and be totally consumed (except for the trunk) in a matter of seconds.

**A-2.3.2.2.(1)** The small scale match flame test in NFPA 701 is a relatively simple test that can be used to assess the condition of flame retardant treatments on samples from fabrics that have been in use for a while. It is not intended that NFPA 701 be used as the primary standard for application of fire retardant treatments.

**A-2.4.1.1.(1)** Accumulation of a certain amount of combustible waste material in and around buildings may be necessary for the day-to-day operation of many industrial or commercial premises. If basic measures of good housekeeping are observed, the presence of these combustibles may not constitute an "undue fire hazard."

**A-2.4.1.1.(2)** The defined term "service rooms" includes boiler rooms, furnace rooms, incinerator rooms, garbage rooms, janitors' closets and rooms to accommodate air-conditioning or heating appliances, pumps, compressors and electrical services. The intent of Sentence 2.4.1.1.(2) is to discourage the use of these rooms for storage of miscellaneous combustible materials. If storage space is needed in a building, a room that does not contain building service equipment should be provided. Even in garbage rooms, combustible materials should not be allowed to accumulate. When the garbage is periodically cleared from the room, the room should be empty, except for the garbage container itself.

**A-2.4.1.1.(5)** Acceptable measures to ensure buildings are protected from fires in receptacles containing combustible materials and stored outside, can include the measures described in NFPA 80A, "Protection of Buildings from Exterior Fire Exposures."

**A-2.4.1.4.(5)** Containers for combustible recyclable material should not be located in areas where there is the likelihood of sources of ignition being introduced to the contents. Lunch rooms, coffee rooms and staff lounges are building areas where persons congregate and, in some cases, are permitted to smoke. This creates a potential hazard that can be reduced by prohibiting the containers. If containers are necessary in these areas, they should be noncombustible with suitable covers or lids that would contain the outbreak of fire.

**A-2.4.4.5.(1)** Propane fuelled vehicles conforming to CAN/CGA-B149.5, "Installation Code for Propane Fuelled Systems and Tanks on Highway Vehicles," will have a green and white window label affixed to the vehicle. A similar replacement label may also be affixed to vehicles that do not conform to the above standard because of the loss of the previous window label due to glass replacement, etc. These replacement window labels will not include the B149.5 parking label and, therefore will be prohibited from parking in enclosed public facilities.

Mo.	Installed
1	1997
2	
3	
4	
5	1998
6	
7	
8	
9	Expiry
10	
11	
12	
2002	
2003	

Size: Approximately 110 mm x 65 mm  
 Colour: White background with green lettering  
 Green diamond with white letters

(a) Window label

Meets the B149.5 code requirements for enclosed parking as at installation date

Size: Approximately 50 mm x 10 mm  
 Colour: Clear label with green lettering  
 Note: Parking label is inserted in rectangular box on window label if vehicle conforms to CAN/CGA-B149.5, "Installation Code for Propane Fuelled Systems and Tanks on Highway Vehicles."

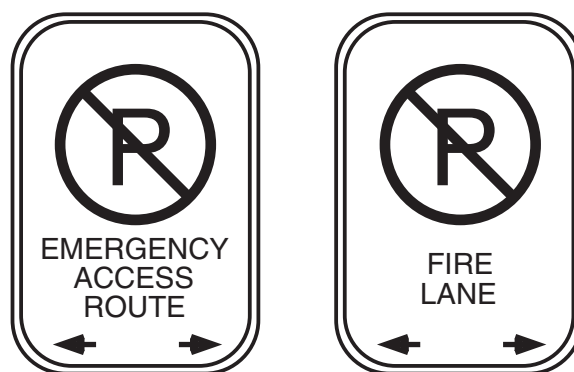
(b) Parking label

**Figure A-2.4.4.5.**  
**Propane fuelled vehicle window and parking labels**

**A-2.4.5.1.(1)** Measures which can be considered to limit fire spread include sufficient clear space between the fire and adjacent buildings, combustibles and woodlands, the size and height of the pile of combustibles to be burned, prevailing meteorological conditions, fire control measures such as hoses and water tanks and, if a receptacle is to be used, the design of the receptacle. In some cases, a permit or licence may be required for open-air fires.

**A-2.4.6.1.(1)** Vacant buildings frequently become the target of vandalism and arson. They should be locked, and accessible windows and doors should be barricaded to prevent unauthorized entry. However, fire department access to the interior of the building in the event of a fire should not be made unduly difficult.

**A-2.5.1.5.(2)** Signs that would meet the intent of this Sentence are as follows:



Size: 300 mm x 450 mm  
 Colour: RED - Circle and slash  
 BLACK - Lettering, arrows and border  
 SILVER (WHITE) - Background  
 Sign: Hi-intensity grade reflective sheeting (3M or equal)  
 SIGN BLANK - 0.081 in. high tensile aluminum; or 0.5 in. Crezone overlay plywood - both sides (Weldwood Duraply or equal)  
 Note: Use applicable arrow right and arrow left to indicate limits of zone; and double arrows on mid-zone signs.

**Figure A-2.5.1.5.(2)**  
**No Parking signs**

**A-2.6.1.4.(1)** External inspection of enclosed chimneys and surrounding construction may require the installation of one or more access openings in the enclosure surrounding the chimney. The presence of scorched or charred adjacent combustible construction will indicate the need for further investigation of the cause of the overheating.

Internal inspection of chimneys can be accomplished by lowering a light from the top, insertion of a light at the bottom or at intermediate locations, together with the use of one or more mirrors.

During inspection of a chimney connected to an operating appliance, the presence of dense smoke at the outlet will indicate improper operation of the appliance, incorrect sizing of the chimney or the use of unsuitable fuels. These factors must be corrected promptly to reduce accumulation of combustible deposits on the chimney and flue pipe walls.

## A-2.6.1.4.(2)

**A-2.6.1.4.(2)** The presence in a chimney of deposits of soot or creosote in excess of 3 mm thick will indicate the need for immediate cleaning, possible modification of burning procedures, and more frequent inspections.

**A-2.6.1.4.(3)(a)** Structural deficiencies are deviations from required construction, such as the absence of a liner or inadequate design of supports or ties. Instances of decay are cracking, settling, crumbling mortar, distortion, advanced corrosion, separation of sections, or loose or broken supports.

**A-2.6.1.9.(3)** Depending on the amount of cooking equipment usage, the entire exhaust system, including grease extractors, should be inspected at intervals not greater than 7 days to determine if grease or other residues have been deposited within. When grease or other residues are in evidence as deposits within the hood, grease removal devices, or ducts, the system should be cleaned. In general, exhaust systems should be cleaned at intervals not greater than 12 months, but in the case of deep fat cooking, char broiling or similar cooking operations, the systems should be cleaned at intervals not greater than 3 months.

**A-2.7.1.3.(1)** The Fire Code uses three criteria to determine the maximum number of persons permitted in a building or floor area where the authority having jurisdiction posts an occupant load.

The maximum occupant load of a building is determined by

- (a) the calculation of the exit capacity of the means of egress,
- (b) the design load calculated by using Table 3.1.16.1. of the ABC, or
- (c) by the posting of an occupant load by the building authority having jurisdiction in conformance with Sentence 3.1.16.1.(2) of the ABC.

Table 3.1.16.1. is intended to allow a building designer to calculate a minimum occupant load for the purposes of designing certain building features, such as means of egress and fire alarm systems. The designer may choose to design to accommodate more or fewer persons, in which case the actual design occupant load must be posted in a conspicuous location. In this case, the building authority having jurisdiction will require that a permanent sign indicating the maximum number of persons permitted be posted in the building or floor area.

Table 3.1.16.1. should not be used as the only regulating factor in establishing the maximum occupant load for the building. The initial procedure should include a calculation of the exit capacity of the means of egress system for the building. The result of these calculations may not be consistent with values obtained using Table 3.1.16.1.

but will confirm if the capacity of the existing system is adequate for the occupant load.

Area per person in Table 3.1.16.1. is calculated based upon the area of a room or space excluding structural or other permanent features, such as walls, columns or ramps, but includes non-fixed items, such as tables, chairs, millwork and movable partitions. In some circumstances, different design factors in Table 3.1.16.1. may apply to the same floor space. For example, a floor space may have a designated standing space as well as a designated table and chair space. Each area would be calculated for the maximum number of persons permitted.

It should also be noted that Article 2.1.3.1. of this Code requires fire protection systems to be installed in conformance with the ABC. This means that if the posted occupant load exceeds the limits for which a protection system is required by the ABC, the system must be installed in the building.

**A-2.7.1.4.(2)** Sentence 3.1.16.1.(2) in the ABC requires that the occupant load used in the design of a floor area be posted if it differs from that determined by Table 3.1.16.1.

**A-2.7.3.1.(1)** Subsections 3.2.7. and 3.4.5. in the ABC describe the requirements for placement of exit signs, and emergency and non-emergency lighting requirements.

**A-2.8.1.2.(1)** Adequately trained supervisory staff can be of great value in directing people to move in an orderly fashion in the event of a fire and in carrying out appropriate fire control measures until the public fire department arrives. These measures are, as described in the fire safety plan, developed in cooperation with the fire department. The supervisory staff referred to in this Section are assigned their responsibilities by the building owner, unless the public fire department is prepared to take on these responsibilities. Except in hospitals and nursing homes, it is not intended that supervisory staff should be in the building on a continuous basis, but that they should be available to fulfill their obligations as described in the fire safety plan on notification of a fire emergency. In hospitals and nursing homes, however, staff must be in the building at all times to assist occupants who are not capable of caring for themselves in an emergency.

**A-2.8.2.1.(1)** The fire safety plan may provide important information to the fire department for use in preparation of pre-fire plans for fire fighting procedures in specific buildings. This is especially true for buildings where flammable or combustible liquids or other dangerous goods are stored.

**A-2.8.2.1.(1)(a)(i)** These procedures should also include training of authorized personnel for silencing fire alarm and alert signals under specified

conditions. If special keys or devices are required to operate the alarm system, they should be readily available to supervisory staff on duty.

**A-2.8.2.1.(1)(a)(iv)** Some occupants of a building may require special assistance during evacuation because cognitive, sensory, or physical limitations make them unable to proceed independently to a place of safety. Fire safety for these persons will depend to a large extent on preplanning and on their awareness of the fire protection measures incorporated into the building. In some buildings, it may be appropriate to advise such occupants of these provisions by posted notices, handouts or other suitable means. In certain residential occupancies, such as hotels or motels, staff should be aware of rooms occupied by persons requiring special assistance during evacuation and should inform the responding fire department.

**A-2.8.2.7.(1)** The following information, where applicable, may be used in establishing emergency procedures to satisfy the requirements of this Sentence.

- (a) Alert everyone in the suite should fire occur in your suite.
- (b) CALL THE FIRE DEPARTMENT at \_\_\_\_\_ or 911, and give the complete address and suite number, if possible.
- (c) Leave your suite; CLOSE BUT DO NOT LOCK THE DOOR.
- (d) Sound the fire alarm in the corridor.
- (e) If the fire is in the early stage, use the building's fire fighting equipment.
- (f) Leave your floor via the stairway AND DO NOT USE AN ELEVATOR.
- (g) Walk, DO NOT RUN, to the lobby.
- (h) Once you have left the fire area, DO NOT RETURN TO IT.
- (i) Meet the fire department in the main lobby, unlock the front door and inform them of the location of the fire.

Further information and assistance may be obtained from the fire department or authority having jurisdiction.

**A-2.8.2.8.(2)** Interruption of normal automatic operation of the fire alarm system for periodic testing purposes constitutes a "temporary shutdown". Appropriate alternative measures for informing building occupants and the fire department of a fire during a shutdown of a fire alarm system should be worked out in cooperation with the local fire department. The alternative measures decided upon should be recorded as part of the building fire safety plan.

**A-2.8.3.1.(1)** A fire safety plan is of little value if it is not reviewed periodically so that all supervisory staff remain familiar with their responsibilities. A fire drill, then, is at least a review

of the fire safety plan by supervisory staff. The extent to which non-supervisory staff participate in a fire drill should be worked out in cooperation with the fire department. The decision as to whether all occupants should leave the building during a fire drill should be based on the nature of the occupancy.

It may be necessary to hold additional fire drills outside normal working hours for the benefit of employees on afternoon or night shifts, who should be as familiar with fire drill procedures as those who work during the day. If full scale fire drills are not possible during non-regular working hours, arrangements should be made so that night-shift supervisory staff can participate in fire drills conducted during the daytime.

**A-2.9.3.5.(1)** The type of fire alarm and emergency communication system anticipated for tents and air-supported structures will vary according to the hazard and the number of occupants. If a tent or air-supported structure is to be permanent, a fire alarm and emergency communication system, as defined in the ABC, may be required. If such structures are to be temporary, however, a somewhat less sophisticated system is anticipated, depending on local conditions.

**A-2.14.1.1.(2)** In demolition operations in certain buildings which do not pose an exposure hazard to other buildings, or in which there is little fire hazard to occupants, as in small buildings, the degree of application of this Section may be minimal. The degree of application should be determined in advance in conjunction with the authority having jurisdiction.

Construction projects can range from large multi-storey buildings to small single-storey residences and may include additions or renovations to existing buildings. The degree to which this Section should apply to each project should be determined in advance, as part of the fire safety plan for the construction project, taking into consideration such issues as the size of the project and the site conditions.

**A-2.14.1.2.(2)(c)** The control of fire hazards in and around buildings also includes fire protection for combustible construction materials and combustible refuse on the site. The sizes of piles of materials and refuse and the location of such piles in relation to adjacent buildings are factors which should be considered in determining which fire protection measures should be employed. The selection of fire protection measures for demolition operations should also recognize the demolition procedure being used, the specific conditions existing on the site and the fire fighting capabilities of the responding fire department.

## A-2.14.1.2.(2)(d)

**A-2.14.1.2.(2)(d)** When demolition operations are in progress in a building of combustible construction, an effort should be made to retain any sprinkler systems in operation as long as possible, to ensure added protection for the structure and the surrounding buildings.

**A-3.1.1.4.(1)(a)** For purposes of this exemption, a distributor is deemed to be a commercial enterprise regularly handling or storing more than 1 500 kg of Class 2 gases for purposes of resale. Such distributors are expected to follow the same good engineering practices as their suppliers. The document CGA P-1, "Safe Handling of Compressed Gases in Containers," published by The Compressed Gas Association Incorporated, represents good engineering practice for the handling of Class 2 gases.

**A-3.1.2.3.(2)** The International Maritime Organization, the International Civil Aviation Organization, the United Nations and Transport Canada are examples of regulatory authorities that may establish standards for the design and construction of packages and containers for dangerous goods.

**A-3.1.2.4.(2)(a)** Methods of preventing valve damage include the use of valve caps, storage in crates (for small cylinders) and the provision of steel rings or protective handles. Certain high pressure cylinders are required by other legislation to be equipped with valve caps.

**A-3.1.2.5.(1)** Reactive substances may include various classes of unstable or reactive dangerous goods, such as Class 4 flammable solids, Class 5 oxidizing substances or unstable Class 2 gases.

**A-3.2.1.1.(1)** Section 3.2. applies to all parts of buildings, including warehousing or storage areas, manufacturing areas, shipping and receiving areas, and sales areas. It does not apply to the storage of unpackaged grain or coal. Additional requirements in Part 5 of this Code address the dust hazard associated with bulk grain or coal storage.

**A-3.2.1.1.(1)(a)** Chapter 2 of NFPA 231, "General Storage," gives an extensive description with numerous examples of commodities for classification purposes and should be consulted. The following is a brief overview of the NFPA 231 classification of commodities:

A Class I commodity is defined as essentially non-combustible products in ordinary corrugated cartons or in ordinary paper wrappings, with or without combustible pallets.

A Class II commodity is defined as Class I products in slatted wooden crates, solid wooden boxes, multiple thickness paperboard cartons or equivalent

combustible packaging material, with or without combustible pallets.

A Class III commodity is defined as wood, paper, natural fiber, cloth, or Group C plastics, with or without combustible pallets. Products may contain a limited amount of Group A or B plastics.

A Class IV commodity is defined as Class I, II, or III products in corrugated cartons, containing an appreciable amount of Group A plastics or with Group A plastics packaging, with or without combustible pallets. Group B plastics and free-flowing Group A plastics are also included in this class.

Group A plastics include, but are not limited to, ABS, acrylic, butyl rubber, fiberglass reinforced polyester, natural rubber (if expanded), nitrile rubber, polycarbonate, polyester elastomer, polyethylene, polypropylene, polystyrene, polyurethane, highly plasticized PVC, and SBR.

Group B plastics include, but are not limited to, cellulose, fluoroplastics, natural rubber (not expanded), nylon, and silicone rubber.

Group C plastics include, but are not limited to, fluoroplastics, melamine, phenolic resins, rigid PVC, and urea formaldehyde.

**A-3.2.2.2.** The purpose of this Article is to provide adequate access to the interior of the storage area for fire fighting and overhaul operations. Means of egress must also be provided in accordance with Section 2.7. of the AFC. The use of dead-end aisles in storage areas should be minimized because of the potential hazard they create with respect to egress. Access aisles required in Sentence (2) include aisles to fire department access panels, or to fire protection equipment such as sprinkler control valves, fire hose stations, portable extinguishers and fire alarm pull stations.

Sentences (4) to (8) prescribe requirements for main access aisles in the storage area. More than one main access aisle may be required depending on the storage configuration and alternate arrangements to a single main access aisle are permitted in Sentence (7). These requirements are in addition to the general requirement for 2.4 m aisles separating individual storage areas. The width of subsidiary aisles within individual storage areas is determined by material handling needs.

Fire department access to a storage area can be by means of doors or access panels on exterior walls, or through doors from another fire compartment in the building, provided that fire compartment in turn has adequate fire department access. The access points should be as remote from each other as possible. Where practicable, the preferred

arrangement is for main aisles to terminate at exterior doors on opposite sides of the building.

Where stored products are liable to expand with the absorption of water, there exists a significant danger of collapse of the products into the aisles. It does not matter whether the products are in racks or not, nor whether the water comes from hose streams or sprinklers. Examples of such products include certain paper products and baled rags. Numerous fire fighters have been killed through being crushed by falling products, or through being trapped after their escape routes have become blocked by fallen products. Special consideration should be given in these cases to rack design, aisle widths and layout to prevent such hazards or to minimize their effect.

**A-3.2.2.3.(3)** In unsprinklered buildings, a clear space is required above the storage to permit hose streams to be directed onto the top of storage.

**A-3.2.2.3.(6)** Clearance between stored products and heating equipment must also be maintained in conformance with Section 2.6. of the AFC, which references Part 6 of the ABC for installation requirements for heating systems. All stored combustible materials should be kept away from hot elements of heating equipment.

**A-3.2.2.4.(3)** Section 4-4 of NFPA 231, "General Storage" gives sprinkler system design criteria for areas where combustible pallets are stored, based on the height, area and type of pallets.

**A-3.2.3.2.(2)** For self-contained, multi-tiered structural rack or shelf systems, the storage height should be determined as the height from the lowest floor level to the top of storage on the uppermost tier.

**A-3.2.3.3.(4)** NFPA 13 and NFPA 231 do not provide sufficient information on design of sprinkler systems in buildings used for the storage of closed containers of distilled beverage alcohol. Design criteria representing good engineering practice for such sprinkler systems are available in such documents as Data Sheet 8-8, "Distilled Spirits Storage" published by Factory Mutual Engineering Corporation.

**A-3.2.4.2.(1)** The volume of tires in a storage area can be determined by measuring to the nearest 0.1 m the length, width and height of the piles or racks intended to contain the tires. In racks, the top shelf is assumed to be loaded to maximum possible height, while observing required clearances between structural elements and sprinklers.

**A-3.2.5.1.(1)** Aerosol products that are displayed in mercantile occupancies represent a lower hazard and do not require specific storage limits or additional fire protection provided they have been removed from their combustible cartons or cartons

have been display-cut so that only the bottom and the lowest 50 mm of the side panels is retained. The storage of packaged aerosols in mercantile occupancies shall nevertheless conform to this Subsection.

**A-3.2.5.2.(1)** This Code has adopted the aerosol classification system developed by the National Fire Protection Association in NFPA 30B, "Manufacture and Storage of Aerosol Products."

Examples of Level 1 aerosol products include shaving cream, spray starch, window cleaners, alkaline oven cleaners, rug shampoos, some air fresheners and some insecticides. These aerosols are less hazardous than Level 2 or Level 3 aerosols, and represent a storage hazard comparable to Class III commodities.

Examples of Level 2 water-miscible flammable base aerosol products include most personal care products such as deodorants (except for oil-based antiperspirants), and hair sprays. They may also include antiseptics and anesthetics, some furniture polishes and windshield de-icers. Level 2 aerosols are less hazardous than Level 3 aerosols.

Examples of Level 3 aerosol products include some automotive products such as engine and carburetor cleaners, undercoats and lubricants; some wood polishes, paints and lacquers; some insecticides; and oil based antiperspirants.

In Canada, some aerosol products are required by the "Controlled Products Regulations," the "Consumer Chemicals and Containers Regulations" and certain other legislation, to bear flammability hazard symbols. The nature of the symbol on the can is determined on the basis of a flame projection test, which measures the susceptibility of the aerosol spray to ignite; this is most important for protecting consumers who, for example, might be smoking while using an aerosol product. A direct comparison between the flammability hazard symbols used in Canadian regulations and the NFPA Level 1, 2 or 3 classification system used in the AFC is not reliable as the latter measures the overall contribution of flammable base product, combined with flammable gas propellant, to the rate of growth and severity of a fire involving a substantial number of aerosols.

**A-3.2.7.3.(1)(b)** Part 4 of the AFC specifies ventilation rates to prevent the buildup of dangerous concentrations of flammable vapours in rooms used for storing flammable and combustible liquids. The same principles should apply to dangerous goods capable of releasing toxic gases, or where the accidental mixing of incompatible substances could generate flammable vapours or toxic gases. Where no guidance is given, the design of the ventilation system should conform to good engineering practice. Recommendations in the

## A-3.2.7.6.(2)

National Fire Protection Association standards, or in the document "Industrial Ventilation: A Manual of Recommended Practice," produced by the American Conference of Governmental Industrial Hygienists, would be considered examples of good engineering practice.

**A-3.2.7.6.(2)** It is assumed that Material Safety Data Sheets (MSDS) will in many cases be provided as part of the documentation for the "Transportation of Dangerous Goods Regulations," or the "Workplace Hazardous Materials Information System."

The following are examples of basic principles that should apply to any storage situation involving dangerous goods:

- (a) Chemicals should not be stored using an alphabetical sequence system but should be grouped according to compatibility.
- (b) Organic materials should not be stored with either strong acids or oxidizers.
- (c) Alkalis should not be stored with strong acids or chlorinated hydrocarbons.
- (d) Strong acids should not be stored with oxidizers.
- (e) Sulphites, bisulphites and sulphides should not be stored with acids.

Poisonous chemicals should not be stored together on the basis that they are poisons, but rather on the basis of compatibility. As with the storage of all chemicals, the primary consideration is what might happen in the event of a mishap causing them to be mixed. For instance, the following are all classified as Class 6.1 poisonous substances but will cause serious problems when mixed in the presence of water (such as water used for fire fighting purposes):

- (a) Sodium azide + dimethyl sulphate = explosion;
- (b) Sodium cyanide + anhydrous chloral = highly toxic vapour cloud.

Poisonous substances should not be stored in the vicinity of chemicals that are designated as B.P., B.P.C., U.S.P., F.C.C. and N.F. grades. Many of these chemicals find their way into cosmetics, pharmaceutical drugs and foodstuffs. A spill of poisonous substance would not only cause contamination of the product itself, but also of the outside of the container and of the clean room in which they are processed.

**A-3.2.7.9.(1)** So many types, quantities, and concentrations of dangerous goods could be present in a building that setting maximum quantities allowed in unprotected buildings is very difficult. The hazard presented by the dangerous goods is not necessarily a function of their inherent flammability, but rather a function of their potential for hampering fire fighting. If the area involved in dangerous goods storage is large enough, the owner

must provide some degree of built-in automatic fire suppression for the building. Therefore, the point at which installation of an active fire suppression system becomes mandatory is based on the total area involved in dangerous goods storage, regardless of the product stored.

The active fire suppression system intended is a sprinkler system, installed throughout the building, not just in the area of dangerous goods storage. The objective is to control both a fire originating in a spot remote from the dangerous goods, so that it never threatens the dangerous goods, and a fire involving the dangerous goods themselves. Even if a fire originates in a dangerous good on which water should not be applied (stored pesticides for example), sprinklers may provide better control than alternative fire fighting measures. A sprinkler system should control the fire, limit its spread, and minimize the number of containers that fail. The sprinkler alarm will notify responsible persons who can take corrective action while the fire is small. The amount of water applied to the pesticide by the sprinklers will be small in comparison to what will have to be applied by hose streams once the fire is established.

Article 6.5.1.1. in the AFC refers to the ABC, which sets the basic criteria for sprinkler systems. These criteria may not be appropriate for specific dangerous goods. For example, water may not be the best extinguishing agent to use on a particular product. In such cases, special arrangements may be required, such as isolating that product in an unsprinklered room protected by a fixed fire suppression system conforming to Article 6.8.1.1.

It is assumed that the fire suppression system will be designed by persons experienced in such design, using good engineering practice to establish design criteria, such as type of suppressant to use, and rate of application.

**A-3.2.7.10.(1)** Venting of smoke and other products of combustion can be achieved by opening roof vents, breaking skylights, removing panels or opening windows. Smoke and hot gases should be vented directly to the outside.

**A-3.2.7.12.(2)** Access to at least 2 sides of a building used for storage of dangerous goods is required so that, if necessary, fire fighting operations can be set up on the upwind side of the building, to minimize the adverse effects of toxic smoke.

**A-3.2.7.12.(3)** Protective clothing worn by fire fighters in a fire involving dangerous goods is bulkier than the usual fire fighting turn-out gear. Therefore, Sentence 3.2.7.12.(3) requires access openings into buildings used for the storage of dangerous goods to be wider than otherwise required by the ABC.

**A-3.2.7.13.(1)** Fire fighters need to identify the substances they may encounter in a building during a fire. Labelling of products to comply with the Occupational Health and Safety Act, Hazardous Products Act and their Regulations or the "Transportation of Dangerous Goods Regulations" are deemed to satisfy this requirement.

**A-3.2.7.14.(1)** One or more placards at the door into a room used for storage of dangerous goods are required to inform fire fighters that dangerous goods are contained within. In larger storage areas containing a variety of dangerous goods in different individual storage areas, each individual storage area should have placards.

**A-3.2.8.2.(1)(d)** When a flammable mixture of air and vapour/gas/dust is ignited and causes an explosion, the exothermic reaction results in the rapid expansion of heated gases and the corresponding pressure waves travel through the mixture at sonic or supersonic velocities. The pressures developed by an explosion very rapidly reach levels that most buildings and equipment cannot withstand unless specifically designed to do so. Explosion venting consists of devices designed to open at a predetermined pressure to relieve internal pressure buildup inside a room or enclosure, hence limiting the structural and mechanical damage. Available information indicates that 0.064 m of vent area per cubic metre of room or enclosure volume (1 ft / 50 ft) is generally considered as the minimum recommended venting ratio.

The major parameters to be considered in designing an explosion venting system for a building are:

- the physical and chemical properties of the flammable air mixture, such as the particle size or the droplet diameter, the moisture content, the minimum ignition temperature and explosive concentration, the burning velocity or explosibility classification, the maximum explosion pressure and the rate of pressure rise,
- the concentration and dispersion of the flammable mixture in the room,
- the turbulence and physical obstructions in the room,
- the size and shape of the room, the type of construction and its ability to withstand internal pressures, and
- the type, size and location of relief panels.

**A-3.2.8.2.(2)** The following Table gives the specific volume (m<sup>3</sup>/kg) of some common gases at normal temperature and pressure. This information is available from manufacturer's literature and can be used to convert gas weight (kg) into gas expanded volume (m<sup>3</sup>), and vice versa. Cylinder data for industrial gases can also be found in Data Sheet 7-50, "Compressed Gases in Cylinders,"

published by Factory Mutual Engineering Corporation.

**A-3.2.9.3.(1)** The purpose of this requirement is to prevent the storage of ammonium nitrate in facilities which contain a space below the floor where molten ammonium nitrate could pool in the event of a fire.

**A-3.2.9.3.(2)** Copper or its alloys should not be used where they can come in contact with ammonium nitrate as they can react with it to form potentially explosive mixtures.

**A-3.3.1.1.(1)(d)** Hogged material can be described as mill waste consisting mainly of hogged bark but may include a mixture of bark, chips, dust, or other by-products from trees. This also includes material designated as hogged fuel.

**A-3.3.1.1.(1)(e)** Factory-assembled combustible structures, such as mobile or modular homes and office trailers, that are transportable in one or more sections, are designated as manufactured buildings in this Section.

**A-3.3.1.1.(2)(c)** An intermodal shipping container can be described as a standard sized reusable structure into which commodities are

**Table A-3.2.8.2.  
Specific Volume of Common Gases**

Gas	Specific Volume (m <sup>3</sup> /kg)
Acetylene	0.9
Ammonia, anhydrous	1.4
Arsine	0.3
Butane	0.4
Carbon dioxide	0.5
Chlorine	0.3
Ethylene oxide	0.5
Fluorine	0.6
Hydrogen	12.0
Methane	1.5
Methyl acetylene	0.6
Methyl chloride	0.5
Nitrogen	0.9
Oxygen	0.8
Phosphine	0.7
Propane	0.5
Propylene	0.6

### **A-3.3.1.1.(2)(g)**

packed and designed to be used in more than one mode of transportation.

**A-3.3.1.1.(2)(g)** Treated forest products are those which have been coated or impregnated with flammable or combustible liquids. Ranked piles are typically piles of logs evenly arranged by conveyor, crane or other means.

**A-3.3.2.6.(2)** The width and location of gates in a fire department access route should take into account the connection with public thoroughfares, width of the roadway, radius of curves, and the type and size of fire department vehicles available in the municipality or area where the storage site is located. Padlocks that can be forced and replaced are preferred by fire departments for easy access to the storage site.

**A-3.3.2.16.(1)(b)** Where on-site reservoirs or other established water supplies are used as a fire department draft source, they shall be equipped with dry hydrants in accordance with NFPA 1231, "Water Supplies for Suburban and Rural Firefighting," APPENDIX B.

Other water supply systems or other measures may be used if the systems or measures will provide sufficient fire suppression capability in the circumstances and if the systems or measures are accepted by the authority having jurisdiction.

**A-3.3.2.17.(2)** Experience has shown that water supplies for a yard fire hydrant system capable of supplying four 19 L/s hose streams simultaneously is sufficient to handle the demand created by a well equipped and manned fire department response. Hydrants with the same hose threads as the local fire department equipment, located at 75 m intervals and equipped with 60 m of 65 mm hose assist fire fighters by permitting rapid hose lays to all parts of the storage areas. Large stream equipment such as portable turrets and deluge sets require 57 to 75 L/s for each unit. Monitor towers may require supplies in excess of 75 L/s for each unit. In large yards, where the hazard is severe, many of these units may be operated simultaneously.

**A-3.3.3.2.(1)** Where the adjoining property is land which may be built upon or used for storage, it is intended that the required clearance be maintained between the stored products and the property line. If the adjoining property does not present a fire exposure hazard, such as a street, right of way, watercourse, or park land, the required clearance could be beyond the property line. In all cases, care should be taken that the storage close to the property line does not defeat the purpose of other safety measures prescribed in this Code.

**A-3.3.6.1.(1)** A pile of this size will contain more than 2 500 and fewer than 10 000 unshredded passenger tires, depending on the degree of

compaction and packing obtained. For purposes of estimating tire quantities it can be assumed that a pile such as this will contain approximately 5 000 tires. If the tires are shredded it is estimated that a pile of this size would contain approximately 15 000 passenger tires.

**A-3.3.6.2.(1)** This Subsection applies to the outdoor storage of tires or shredded tires where the bulk volume of stored product exceeds 300 m<sup>3</sup> but does not apply where the stored tires or shredded tires are covered by a minimum depth of 150 mm of noncombustible material as would be the case in a properly operated sanitary landfill. Similarly, inground (buried) storage of tires in a lined and covered trench system with a view to future recovery and reuse would not be subject to this Subsection.

**A-4.1.1.1.(1)** The all-inclusive phrase "buildings, structures and open areas" includes but is not limited to tank farms, bulk plants, fuel dispensing stations, industrial plants, refineries, process plants, distilleries, and piers, wharves and airports that are not subject to over-riding federal control. Part 4 of the AFC applies wherever flammable or combustible liquids are used or stored, except as specifically exempted in Sentences 4.1.1.1.(2) and (3).

**A-4.1.1.1.(2)** Certain areas in refineries, chemical plants and distilleries will not meet all Code requirements because of extraordinary conditions. Design should be based on good engineering practice and on such factors as manual fire suppression equipment, daily inspections, automated transfer systems, location of processing units, and special containment systems, piping, controls and materials used. NFPA 30, "Flammable and Combustible Liquids Code" and NFPA 36, "Solvent Extraction Plants" are examples of good engineering practice and can be referred to by the designer and the authority having jurisdiction.

**A-4.1.1.1.(3)(b)** Storage tank systems installed in conformance with CAN/CSA-B139, "Installation Code for Oil Burning Equipment," must comply with Part 4 for items which are outside of the scope of the CSA standard. This includes, but is not limited to, site sensitivity classification, registration, secondary containment, testing, maintenance, repair, upgrading and removal of storage tank systems.

**A-4.1.1.1.(3)(c)** Such facilities may include isolated construction sites and earth moving projects, including gravel pits, quarries, and borrow pits where in the opinion of the authority having jurisdiction, it may not be necessary to comply with the more restrictive requirements of Part 4.

**A-4.1.1.2.(1)** The powers, duties and functions of the Administrator in Sentence 4.1.1.1.(2) and Article 4.1.1.3. have been delegated by the Minister

of Labour to the Petroleum Tank Management Association of Alberta (PTMAA) in accordance with the Storage Tank System Management Regulation (Alta. Reg. 291/95. as amended).

**A-4.1.2.1.** The classification system for flammable liquids used by the “Transportation of Dangerous Goods Regulations” (TDGR) differs from the NFPA classification system used in the AFC. In the AFC, only liquids with a flash point below 37.8°C are referred to as “flammable” liquids, whereas liquids having flash points at or above 37.8°C are “combustible” liquids. In contrast, the TDGR, which regulate “flammable liquids” as Class 3 Dangerous Goods, define “flammable liquids” as liquids having a flash point below 61°C. Therefore, the TDGR term “flammable liquids” includes Class II liquids (with a maximum flash point of 60°C), which are referred to as “combustible liquids” in the AFC terminology. The TDGR do not include Class IIIA liquids that have a flash point above 60°C.

The TDGR further classify flammable liquids into Divisions 1, 2, and 3, depending on their flash points. Division 1 flammable liquids have flash points below -18°C; Division 2 flammable liquids have flash points at or above -18°C but below 23°C; and Division 3 flammable liquids have flash points at or above 23°C but below 61°C. For the purpose of comparing the TDGR classification system with the AFC system, the differences between 23°C and 22.8°C, and between 61°C and 60°C may be ignored. The results of closed-cup flash point tests may vary by as much as 1°C, so nothing is gained by unnecessary precision. The following table compares the two classification systems.

**A-4.1.2.1.(3)(b)** The NFPA classification system for flammable and combustible liquids includes Class IIIB liquids, which have flash points at or above 93.3°C. These liquids are not regulated by Part 4 of the AFC because they are deemed to represent no greater fire hazard than other combustibles, such as wood or paper products. However, Article 4.1.2.2. clarifies that such liquids are effectively Class I liquids when heated to their flash point temperature.

**A-4.1.2.3.** Used automotive lubricating oil may contain both oil and more volatile Class I liquids, such as gasoline. Tests of representative samples have demonstrated that the flash point of such used oil consistently exceeds 60°C, with an average above 93.3°C. When Class I or II liquids are added to such used oil, the flash point of the resulting mixture will vary with the percentage and flammability of the contaminating liquid and shall be determined by tests.

**A-4.1.2.3.(5)** Haulers of used oil for recycling or disposal may be inserting a suction hose into the tank to pump out the oil. This practice can damage fibreglass reinforced plastic tanks and can lead to spills when the suction hose is removed. To avoid this, used oil tanks shall be fitted with a suction tube and a leak tight coupling. Used oil haulers should find this method preferable. The removable suction tube is required to facilitate the unblocking of a plugged suction tube.

**Table A-4.1.2.1**  
**Comparison of AFC and TDGR Classification Systems**

Flash Point, °C	Boiling Point, °C	AFC Classification	TDGR Classification
below -18	N/A	IA	3.1
at or above -18 and below 22.8 <sup>(1)</sup>	below 37.8	IA	3.2
below 22.8	at or above 37.8	IB	3.2
at or above 22.8 and below 37.8	N/A	IC	3.3
at or above 37.8 and below 60 <sup>(2)</sup>	N/A	II	3.3
at or above 60 and below 93.3	N/A	IIIA	Not Regulated
at or above 93.3	N/A	Not Regulated	Not Regulated

**Notes to Table A-4.1.2.1:**

- (1) For purposes of comparison, 22.8°C is deemed to be equivalent to 23°C, as used in the TDGR.  
 (2) 60°C is deemed to be equivalent to 61°C, as used in the TDGR.

## A-4.1.3.1.

**A-4.1.3.1.** The kinematic viscosity of a liquid influences the choice of test most appropriate for measuring its flash point. For measurement of kinematic viscosity, the ASTM standards referenced use units of centistokes, or stokes. In Canada, the unit used for kinematic viscosity is  $\text{mm}^2/\text{s}$  (cgs), not stokes or centistokes. One centistoke has units of 1 millimetre squared per second ( $1 \text{ mm}^2/\text{s}$ ).

For purposes of comparison, the kinematic viscosity of water is  $1.0038 \text{ mm}^2/\text{s}$  at  $20^\circ\text{C}$ ; of glycerine, approximately  $1185 \text{ mm}^2/\text{s}$ ; and of some common motor oils, near  $1000 \text{ mm}^2/\text{s}$ . Some paints, lacquers and glues have much higher kinematic viscosities, as indicated by the upper limit of  $15000 \text{ mm}^2/\text{s}$  in ASTM D 3278, "Flash Points of Liquids by Setaflash Closed-Cup Apparatus."

The viscosity at which a liquid should no longer be treated as a liquid is addressed in NFPA 30, "Flammable and Combustible Liquids Code." The definition of "liquid" in that document states that "any material that has a fluidity greater than that of 300 penetration asphalt, when tested in accordance with ASTM D 5, "Penetration for Bituminous Materials," is considered to be a liquid.

**A-4.1.4.1.(1)** Additional information on determining the extent of Division 1 or 2 zones in Class I locations can be found in CSA PLUS 2203 HAZLOC, "Hazardous Locations: A Guide for the Design, Construction and Installation of Electrical Equipment," in NFPA 30, "Flammable and Combustible Liquids Code," and in NFPA 497A, "Classification of Class I Hazardous Locations for Electrical Installations in Chemical Process Areas."

**A-4.1.5.3.(1)** Sources of ignition include, but are not limited to, open flames, smoking, cutting and welding, hot surfaces, frictional heat, static, electrical and mechanical sparks, spontaneous ignition, heat producing chemical reactions, and radiant heat.

**A-4.1.5.9.** Limited quantities of Class I liquids are permitted to be stored or used in basements where it is clear that they do not create a fire hazard. Such factors as the size of basement, ventilation, wiring, and proximity to sources of ignition should be taken into account in determining whether an unsafe condition exists.

**A-4.1.6.1.(1)** Measures for control of spills include provision of manhole or catch basin covers for manual closing, and provision of absorbent materials and portable containment dikes. The containment measures should provide sufficient capacity to retain all of the product likely to be spilled, plus the water used for fire fighting purposes. The fire safety plan should include measures for responding to a situation where the containment area could be overtopped.

**A-4.1.6.2.(2)** The Safety Codes Act and Regulations under the Act defines a trap as 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.

**A-4.1.6.3.(2)** A leak of flammable or combustible liquids usually results in a hazard being created which endangers life, property and the environment.

Immediate danger to life and property frequently results when the escaping liquid or vapour is a flammable liquid with a low flash point. Typically, the scenario involves the migration of the liquid into nearby buildings, sewers, tunnels or other underground structures, thus creating a fire and explosion hazard. The prime responsibility for the elimination of this type of hazard falls to the fire official who has responsibility for protection of life and property from fire.

Environmental hazards, including the pollution of potable water supplies, are also present in many instances. These problems often require long-term solutions and although serious, may not create an immediate public danger. The mitigation of this type of hazard rests with environmental officials and the owners of the property. Their concerns become paramount once the danger from a fire or explosion hazard is eliminated.

The fire official would be justified in transferring responsibility for cleanup of the environmental problems to environmental officials and the property owner provided he is satisfied that there is no longer a danger to persons or property from fire or explosion.

It must be emphasized that only through cooperation can the hazards be eliminated. It is essential that fire officials recognize the many facets of the problem and that they make a serious effort to secure the assistance and support of all interested parties.

Testing of tanks and piping and the removal of leaking tanks and any liquid in the earth or on water will require equipment, facilities and expertise that is readily available to contractors or to environmental consultants. Industry specialists have qualifications that will be beneficial when dealing with problems of this nature. Their knowledge and experience can be invaluable. Responsible officials should seek their help and guidance whenever possible. It must also be recognized that a major portion of the responsibility rests with the owner of the leaking equipment and not with the fire or environmental officials. The need for cooperation should be stressed to the owner and his assistance and support should be encouraged.

**A-4.1.6.3.(5)(b)** The local fire or emergency response department is the owner's first contact for

any leak or spill that requires immediate action to lessen the risk of fire or explosion and, secondly, notification to the authority having jurisdiction.

**A-4.1.7.1.(1)** Article 3.3.1.19. in the ABC specifies that ventilation must be provided in conformance with Part 6 of that Code if flammable vapour, gas, or dust could create a fire or explosion hazard. However, Part 6 of the ABC does not provide specific information on the design of ventilation systems to prevent an accumulation of dangerous concentrations of flammable vapours. It refers instead to “good engineering practice” and directs the user to a number of NFPA standards for examples of good practice, depending on the nature of the vapours or dusts. Subsection 4.1.7. of the AFC represents a minimum level of “good practice” for preventing an accumulation of explosive concentrations of vapours from flammable or combustible liquids.

**A-4.1.7.2.(3)** Natural ventilation is normally adequate for the storage of flammable liquids and combustible liquids, or the dispensing of Class II and IIIA liquids. Such ventilation should consist of permanent openings at ceiling and floor levels leading to the outside. At least 0.1 m<sup>2</sup> each of free inlet and outlet openings per 50 m<sup>2</sup> of floor area should be provided. A mechanical ventilation rate of at least 18 m<sup>3</sup>/h per square metre of floor area, but not less than 250 m<sup>3</sup>/h, is normally adequate for rooms with low floor to ceiling height or small enclosed spaces where Class I liquids are dispensed. Ventilation for process areas must be designed to suit the nature of the hazard in accordance with good engineering practice.

**A-4.1.8.2.(1)(b)** Build-up of static electric charges near the surface of liquids being poured into non-conducting containers can be controlled or eliminated by: limiting the filling rate to velocities less than 1 m/s, using a grounded lance or nozzle extension to the bottom of the container, limiting free fall, or using antistatic additives.

**A-4.1.8.2.(3)(b)** It is generally considered that liquids with a conductivity greater than 50 pS/m (pico Siemens per metre) will dissipate static charges so that they will not accumulate to a hazardous potential. Experience indicates that most water miscible liquids, crude oils, residual oils and asphalts do not accumulate static charges.

**A-4.1.8.3.(1)** Products tested and listed by recognized agencies are considered to be designed in conformance with good engineering practice. Underwriters Laboratories Inc. and Factory Mutual Engineering Corporation are currently listing these products.

**A-4.1.8.4.(1)** This Sentence allows temporary fuelling of vehicles from a tank that can be moved

from site to site. For example, such practices may be allowed at construction or earth-moving sites.

**A-4.2.2.3.(2)** Flammable and combustible liquids are classified as Class 3 dangerous goods in accordance with the “Transportation of Dangerous Goods Regulations.” However, Class 3 dangerous goods include liquids with flash points up to 61°C, which means that Class IIIA liquids with flash points above 61°C are not treated as dangerous goods. For the purposes of this Article, Class IIIA liquids should be treated as Class 3 dangerous goods as described in Table 3.2.7.6.

**A-4.2.5.3.(1)** Article 4.2.5.3. addresses the potential hazard where flammable vapours are released during transfer operations in an improperly ventilated area, and where sources of ignition may not be adequately controlled. It is not intended to prohibit the opening of small containers in retail areas of paint stores for the purpose of tinting paints.

**A-4.2.7.5.(2)** Sentence 4.2.7.5.(2) sets no limit to the total quantity of flammable and combustible liquids in a separate or detached storage building. Although total quantity limits of Tables 4.2.7.5.A and 4.2.7.5.B do not apply, the quantity and height limitations specified for the individual storage areas must be complied with in order to take advantage of the exemption for total quantity limits. Requirements pertaining to spatial separation of buildings are found in Subsection 3.2.3. of the ABC. The requirements in this Code for the storage of flammable and combustible liquids must be read in conjunction with applicable provisions in the ABC that impose restrictions on the design of a storage building. For example, the size and height of a building, type of construction, automatic fire suppression and street access are governed in part by Subsection 3.2.2. of the ABC. Environmental protection regulations may contain additional requirements that should be considered in the design of a storage building for flammable and combustible liquids.

**A-4.2.7.7.(1)** Options for fixed fire suppression systems for protection of flammable or combustible liquid storage areas include: automatic sprinkler, foam sprinkler, water spray, carbon dioxide, dry chemical or halon systems. Section 4-8 and Appendix D of NFPA 30, “Flammable and Combustible Liquids Code,” represents good engineering practice for design of sprinkler or foam water systems for flammable and combustible liquid storage areas.

**A-4.2.7.8.(2)** Containers of flammable or combustible liquids could be punctured or deformed by being pushed up against a protrusion from a wall. The required wall clearance is intended to prevent such damage, and to permit visual inspection of the sides of the individual storage

## A-4.2.8.1.(1)

area. The clearance need not be provided for narrow shelves along a wall, where the backs of the shelves can be inspected from the aisle.

**A-4.2.8.1.(1)** Subsection 4.2.8. applies to those portions of an industrial occupancy where the use, storage and handling of flammable and combustible liquids is only incidental, or secondary to the principal activity. The word “incidental” does not imply “small quantity,” or “insignificant amount.” Manufacturers of electronic equipment, furniture and reinforced plastic boats, and automobile assembly plants are typical examples of locations where the use of flammable and combustible liquids is secondary to the principal activity of manufacturing consumer products. In storage areas otherwise governed by Part 3 of this Code, Subsection 4.2.8. applies to the “incidental” storage of flammable and combustible liquids that is deemed to be secondary to the principal activity of storing commodities covered in Part 3. This includes the storage of used lubricating oil in the warehouse portion (industrial occupancy) of a retail outlet. Subsection 4.2.8. also applies to the storage of used lubricating oil at motor vehicle repair and service garages because such storage is secondary to the principal activity of repairing and servicing motor vehicles.

**A-4.2.8.3.(1)(a)** The fire separation required by this Clause should also prevent the passage of vapours.

**A-4.3.1.8.(1)(b)** Examples of devices to prevent overfill include automatic sensing devices for interconnection with shut-off equipment at the supply vehicle, automatic overfill shut-off devices of a float valve or other mechanical type, vent restriction devices, and overfill alarm devices of the audible or visual type.

**A-4.3.2.1.(4)** Boil-over is an event in the burning of certain oils in an open top tank when, after a long period of quiescent burning, there is a sudden increase in fire intensity associated with expulsion of burning oil from the tank. Boil-over occurs when the residues from surface burning become more dense than the unburned oil and sink below the surface to form a hot layer, which progresses downward much faster than the regression of the liquid surface. When this hot layer, called a “heat wave,” reaches water or water-in-oil emulsion in the bottom of the tank, the water is first superheated and subsequently boils almost explosively, overflowing the tank. Oils subject to boil-over consist of both light ends and viscous residues. These characteristics are present in most crude oils and can be produced in synthetic mixtures.

Note: A boil-over is an entirely different phenomenon from a slop-over or a froth-over. Slop-over involves a minor frothing that occurs when

water is sprayed onto the hot surface of a burning oil. Froth-over is not associated with a fire but results when water is present or enters a tank containing hot viscous oil. Upon mixing, the sudden conversion of water to steam causes a portion of the tank contents to overflow.

**A-4.3.2.5.** Guidelines for the protection of storage tanks can also be found in standards published by National Fire Protection Association, Insurers’ Advisory Organization Inc., Industrial Risk Insurers and Factory Mutual Engineering Corporation. Such guidelines are considered as good engineering practice in assessing the protection necessary for tanks.

**A-4.3.7.4.** The primary function of a diked enclosure is to contain the maximum anticipated liquid spill, but sufficient distance between dike and tank shell is also required so that a jet of liquid issuing from a puncture will not over-shoot the dike. The reduction of the tank to dike distance should be made only after consideration of such factors as the proximity of the tanks to buildings and other hazards, the risk associated with the product in the tanks, the location of sewers or water courses and the height of the tank.

**A-4.3.7.5.(1)** When the height of a secondary containment wall exceeds 1.8 m, there is an increased potential for heavier-than-air vapour to accumulate at ground level within the contained area. Depending on the nature of such a vapour accumulation, it may be explosive or sufficiently toxic to seriously endanger personnel. Entry into such a contained area should always be preceded by testing for such a vapour accumulation.

**A-4.3.7.5.(2)** Vapours from Class I liquids may reach unsafe concentrations when confined in the small space between the tank and the secondary containment wall. Remotely operated valves or elevated walkways eliminate the need for personnel to enter the bottom of the contained area to operate a valve.

**A-4.3.8.1.(6)(b)** Secondary containment may consist of the following:

### Tank Secondary Containment

All new Class A installations of underground petroleum storage tanks must have a secondary containment system which collects and contains a leak. This can consist of either (a) or (b) or a comparable system approved by the authority having jurisdiction:

- (a) A Double-Walled Tank – if the secondary containment system consists of a double-walled tank, the inner tank must be constructed in accordance with applicable standards listed in Sentence 4.3.1.2.(1) or

subsequent ULC listings for double-walled underground storage tanks, where the interstitial space of the double-walled tank can be monitored for tightness.

- (b) An Impervious Liner – if the secondary containment system consists of an impervious liner, the impervious liner shall be constructed in accordance with ULC/ORD-C58.9, “Secondary Containment Liners for Underground and Aboveground Flammable and Combustible Liquid Tanks.”

### **Piping Secondary Containment**

All new Class A installations for underground piping systems must have a secondary containment system which collects and contains a leak. This must consist of one of the following:

- (a) Double-Walled Piping – if the secondary containment system consists of a double-walled, non-metallic piping, it shall be constructed in accordance with ULC/ORD-C107.7, “Glass Fibre Reinforced Plastic Pipe and Fittings for Flammable and Combustible Liquids,” CAN/ULC-S633, “Standard for Flexible Underground Hose Connectors,” or ULC/ORD-C107.19, “Secondary Containment of Underground Piping for Flammable and Combustible Liquids,” or
- (b) An Impervious Liner – if the secondary containment system consists of an impervious liner for all piping trenches, it must be constructed in accordance with ULC/ORD-C58.9, “Secondary Containment Liners for Underground and Aboveground Flammable and Combustible Liquid Tanks,” and installed with an impervious liner for all tanks such that the trench liner slopes down to the tank excavation at a uniform gradient of 1 to 100.

**4.3.8.1.(6)(e)** Leak detection may include the following types of technology:

- (a) Observation wells for monthly monitoring of soil vapours or groundwater for flammable or combustible materials, which are constructed with flush joint, threaded pipe casings with a minimum inside diameter of 50 mm and made of plastic PVC or stainless steel. Well screens must be factory perforated with a slot size adequate to prevent entry of filter material. Filter packs should extend 0.5 m above the perforated screen. All standpipes must have a bottom cap or plug. Deviations from this well design which utilize good engineering practice may be accepted by the authority having jurisdiction. At least one well must be installed at the lowest point within a secondary containment system at Class A sites and below the bottom of the tank. Wells must be sealed or capped so as to prevent liquid from entering the well from the surface and clearly

marked as monitoring wells to prevent accidental delivery of product.

- (b) Interstitial monitoring of double-walled tanks and piping using pressure monitoring, vacuum monitoring, electronic monitoring, vapour detection, manual sampling or an equivalent method. Monitoring should be performed on a monthly basis.
- (c) Monthly monitoring using an automatic tank gauging system in conformance with ULC/ORD C58.12, “Leak Detection Devices for Underground Flammable Liquid Storage Tanks,” capable of performing daily inventory reconciliation and performing a total system test capable of detection of a leak rate of 0.76 L/h within a period of 24 h with a probability of detection of 0.95 or greater and a probability of false alarm of 0.05 or less.
- (d) Statistical Inventory Reconciliation SIR’s which is daily inventory control data that is statistically analysed by computer by a vendor which is approved by the PTMAA on a monthly basis, capable of detection of a leak rate of 0.38 L/h within a period of 24 hours with a probability of protection of 0.95 or greater and a probability of false alarm of 0.05 or less.
- (e) Other technologies that have been approved.

**A-4.3.8.1.(6)(f)** Line leak detection may include the following types of technology:

### **Pressurized Piping Systems**

Line leak detectors on pressurized piping systems include a line leak detector constructed in accordance with ULC/ORD-C107.12, “Line Leak Detection Devices for Flammable Liquid Piping,” capable of detecting a leak of 11.4 L/h or greater, at a line pressure of 69 kPa, with a probability of detection of 0.95 and a probability of false alarm of 0.05 within 1 hour of the occurrence of the start of the leak. The line leak detection must incorporate one of the following:

- (a) an automatic shutoff device,
- (b) a flow restriction device, or
- (c) an alarm that indicates a leak.

Line leak detectors for pressurized piping systems must be tested annually to ensure they are operating properly and must not be bypassed from operation.

### **Suction Systems**

All suction lines must be equipped with a single, vertical check valve which is to be installed immediately below the pump. If a check valve is to be located elsewhere, all suction piping trenches must be equipped with a sufficient quantity of monitoring wells which are to be used monthly to test for the presence of flammable or combustible vapours or free product.

## A-4.3.8.3.(2)

**A-4.3.8.3.(2)** Where applicable, the following ULC standards shall be used to repair structural damage to underground storage tanks:

- (a) CAN4-S603(A), "Refurbishing of Steel Underground Tanks for Flammable and Combustible Liquids,"
- (b) CAN4-S615(A), "Refurbishing of Reinforced Plastic Underground Tanks for Petroleum Fuels."

**A-4.3.8.9.(1)** The purpose of anchoring or providing overburden on top of underground storage tanks is to prevent them from lifting out of the ground in the event of a rise in the water table or a flood. Any proposed means of anchorage or overburden must be sufficient to resist the uplift forces on tanks when they are empty and completely submerged.

Means which have been employed successfully to protect tanks against uplift are

- (a) anchor straps to concrete supports beneath them,
- (b) ground anchors, and
- (c) reinforced concrete slabs or planks on top of them.

**A-4.3.9.3.(1)** Stray current from an impressed current system can cause corrosion to tanks protected by sacrificial anodes. Consequently, bonding of sacrificial anode protected tanks and piping into the impressed current system is necessary.

**A-4.3.9.3.(2)** The anodes on a CAN/ULC-S603.1, "Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids," cathodically protected tank are designed to protect the tank only. Inadequate corrosion protection of cathodically protected tanks can occur if the tank is not electrically isolated from the piping or other tanks. This appears to be a commonly encountered fault and needs to be emphasized to installers.

**A-4.3.10.1.** Appendix D of CAN/ULC-S603, "Steel Underground Tanks for Flammable and Combustible Liquids," provides details of vent sizing for underground flammable liquid and combustible liquid storage tanks.

**A-4.3.12.1.(2)** The Fire Code requires all buildings to conform to the ABC with respect to alarm, sprinkler or standpipe systems, and means of egress. Thus the requirements in the ABC for fire protection systems in F-1 occupancies apply to buildings regulated under this Subsection. However, in applying ABC requirements to existing buildings, the practicality and cost of full compliance, and alternative ways to achieve the desired level of safety, as described in Appendix note A-1.1.2.3., should be taken into consideration.

**A-4.3.12.8.(1)** For design of normal and emergency venting of indoor storage tanks, Sentence 4.3.12.8.(1) refers to Subsection 4.3.4., which in turn refers to API 2000, "Venting Atmospheric and Low Pressure Storage Tanks." However, API 2000 is intended for outdoor tanks rather than indoor tanks. The venting rate reduction factors for water spray on the tank surface, or drainage rates for spilled liquids, should not be used to calculate the emergency venting rate of a storage tank installed inside a building. The effects of water spray cooling, and room drainage on the calculated emergency venting rate must be worked out according to good engineering practice. Increased emergency venting capacity may be required.

**A-4.3.12.9.(2)** Good engineering practice for design of supports for suspended storage tanks should meet the intent of Subsection 4.3.3. as far as possible. Such factors as the provision of adequate fire resistance for supports, the need to prevent over-stressing the tank shell or its supports, and resistance to earthquake forces in areas subject to such forces, should be taken into consideration.

**A-4.3.13.4.(1)** The small diameter hose stations permitted in Article 6.2.3.4. are not intended for fighting a flammable or combustible liquid fire. Such fires should be fought using fog nozzles rather than solid water streams, because solid streams may spread the liquid fuel and worsen the situation. The small diameter hoses permitted in lieu of extinguishers are intended to be used for prompt suppression of a small fire in ordinary combustibles, and for prompt wash-down of spilled flammable or combustible liquids, before any fire occurs.

**A-4.3.15.1.(1)** A precision test is a test approved by the PTMAA which will determine if a tank is tight or not tight. The test must be capable of detecting a tank leak as small as 0.38 L/h with a probability of detection of 0.95 or greater and a probability of false alarm of 0.05 or less, accounting for variables such as vapour pockets, thermal expansion of product, temperature stratification, groundwater level, evaporation, pressure and end deflection. When a precision leak test has been required by the authority having jurisdiction, a leak test report shall be forwarded to the authority having jurisdiction within ten days of the test. The leak test report shall contain, as a minimum, the following information:

- (a) property and tank system owner,
- (b) operator of facility,
- (c) registration number of site,
- (d) identification of tanks tested,
- (e) date of test,
- (f) result of test,
- (g) testing firm, and
- (h) test method used.

**A-4.3.15.1.(2)** Methods for testing to determine the location of leaks include ultrasonic, magnetic particle and video graphic testing. The location of leaks in the bottom of a tank shell may also be determined by the vacuum box method. It is anticipated that all such testing will be conducted by individuals or companies experienced in these test procedures.

**A-4.3.16.1.** The recording of pump meter readings, shipments, internal transfers, product delivery receipts or measurements of the level of the contents of a *storage tank* shall not, in itself, be considered as constituting a record as required by this Article. In addition, suppliers of flammable and combustible liquids must provide their customers with sufficient data to conduct a proper inventory reconciliation. Inventories which have been adjusted for volume through temperature compensation must also be available to operators by volume according to meter measurements.

**A-4.4.7.11.(1)** It is good practice to space hangers for pipe having a nominal diameter of 50 mm or less not more than 3.5 m apart.

**A-4.5.1.1.** Section 4.5. applies only to the portion of a property where fuel dispensing operations are conducted. When a facility combines fuel dispensing operations with other types of business (motor vehicle repair garage, convenience store, restaurant, etc.), Section 4.5. is intended to apply only to the fuel dispensing operations and the adjacent business shall conform to other Sections of this Code based on its occupancy classification (assembly occupancy for a restaurant, mercantile occupancy for a convenience store, industrial occupancy for a repair garage, etc.).

**A-4.5.1.1.(2)** An increasing number of fuel dispensing stations have natural and petroleum gas dispensing equipment. Gas regulations made pursuant to the Safety Codes Act outline requirements for installation, handling and dispensing of liquefied gas fuel.

These regulations require attendants to:

- (a) be properly trained and certified,
- (b) not exceed container maximum permitted filling requirements,
- (c) not fill outdated containers or uncertified vehicles,
- (d) be in constant attendance during any transfer or filling operation, and
- (e) not use any dispenser or fill any container that shows evidence of damage, deterioration or incorrect installation.

The Fire Code authority having jurisdiction may request the owner or attendant to show proof of their compliance with gas regulations. Irregularities should be reported to the authority having jurisdiction in the gas discipline.

**A-4.5.2.2.(2)** This requirement is intended to prevent the accumulation of flammable vapours in low areas of buildings. If low areas are equipped with suitable continuously operating mechanical ventilation, flammable vapours would not be expected to accumulate.

**A-4.5.8.4.(1)** The authorized holder of a card or key, having received adequate training in the safe and responsible operation of the equipment, is not considered a member of the "general public." Such is not the case for coin operated or preset dispensers, which could be operated by anyone.

**A-4.5.8.5.(2)(a)** Video surveillance equipment at an unattended self-service outlet provides the owner and the authority having jurisdiction with the ability to monitor accidents, spills or vandalism that may occur at the site. The authority having jurisdiction may accept a variety of surveillance monitoring methods using technologies other than those described in proprietary or central station monitoring systems. Although live continuous surveillance is an ideal method, the intent of this Clause is to allow flexibility in the type of system used. A video surveillance tape of an accident, spill or vandalism will assist the owner and the authority having jurisdiction in identifying the cause of an incident.

A monitoring facility may include a ULC listed monitoring service company, a security monitoring service company or monitoring equipment connected to the owner's security monitoring service which may be located at a corporate office or refinery. The authority having jurisdiction should be consulted regarding the acceptability of the monitoring facility.

**A-4.5.8.7.(2)** When gasoline vapour is allowed to enter into a diesel fuelled engine through the air intake, there is a potential for the diesel engine to run away. In a runaway condition, a diesel engine would accelerate in an uncontrolled manner even if the ignition is switched off, resulting in damage to the engine and potentially causing fire.

**A-4.5.8.9.(2)** Examples of signs to indicate that smoking is not permitted and that the engine ignition must be turned off while the vehicle is being refuelled:

#### A-4.6.4.



Figure A-4.5.8.9.  
Fuel dispensing station signs

**A-4.6.4.** When used in this Subsection, the terms “loading” and “unloading” shall mean the loading and unloading of tank vehicles or tank cars.

**A-4.7.8.1.(1)(a)** Section 38 of the “Oil Pollution Prevention Regulations of the Canada Shipping Act” may apply to flexible cargo hoses described in this Code. The following documents are considered good engineering practice for this application:

“Purchasing, Manufacturing and Testing of Loading and Discharge Hoses for Offshore Moorings” prepared by the Oil Companies International Marine Forum. It can be obtained from: New York Nautical Instrument and Service Corporation, 140 Westbroadway, New York, New York 10013 U.S.A.

“Hose Handbook” prepared by The Rubber Manufacturers Association, Inc. It can be obtained from: The Mail Room, P.O. Box 3147, Medina, Ohio 44258 U.S.A.

**A-4.8.3.5.(2)** Examples of such equipment are dispensing stations, open centrifuges, plate and frame filters, open vacuum filters and surfaces of open equipment.

**A-4.9.1.1.(1)** Beer, wine, and spirits which contain less than 20% by volume alcohol, are not considered to be flammable liquids and are not regulated by this Section. Section 4.9. does not apply to wineries where distilled beverage alcohol is used to fortify wine.

**A-4.9.3.2.** Exposed steel supports do not have a 2 h fire-resistance rating, and need protection as much as timber supports for tanks. Due to the water miscibility of beverage alcohols, automatic sprinklers provide an effective means of achieving the necessary protection, provided there is sufficient space under the tank to permit their installation.

**A-4.9.3.3.(1)** The use of “good engineering practice” in the design of normal and emergency venting is intended to prevent an accumulation of

flammable vapours inside the building that may present an explosion hazard. For new tank installations, this can be achieved by directing breather vents and emergency vents, equipped with flame arrestors or pressure/vacuum valves, to the outside of the building. However, on existing tank installations, installation of such vents may be impractical. Venting into the interior space may not constitute an undue hazard where certain measures are taken to ensure an adequate degree of fire safety. Such measures include, but are not limited to: installation of automatic sprinklers throughout the tank room and under any raised tanks greater than 1.2 m in diameter; classification of electrical equipment and wiring according to the zone classifications of the electrical regulations made pursuant to the Safety Codes Act; provision of adequate natural or mechanical ventilation meeting the objectives of Article 4.9.6.1.; and training of personnel in safe operating procedures.

**A-4.9.5.1.(1)** Piping and pumping systems should be designed to recognized engineering standards and accepted industry practice.

**A-4.10.3.1.(1)(c)** Under certain circumstances the removal of all flammable and combustible vapours and residue from an underground storage tank before its removal from the ground may not be possible. Under these circumstances accepted precautions in co-operation with local fire officials may be necessary to ensure removal operations are conducted in a safe manner.

**A-4.10.4.1.** The reason for making holes in the tank is to discourage possible future use of it as a container for some edible products which would be contaminated by residual deposits if the tank had ever been used for gasoline containing lead or other toxic additives. NFPA 327, “Standard Procedures for Cleaning or Safeguarding Small Tanks and Containers,” and API 2015, “Cleaning Petroleum Storage Tanks,” provide information on safe procedures for such operations.

**A-4.11.2.6.** NFPA 327, “Standard Procedures for Cleaning or Safeguarding Small Tanks and Containers,” and API 2013, “Cleaning Tank Vehicles Used for the Transportation of Flammable Liquids,” provide information on procedures for such operations.

**A-5.1.2.1.(1)** Electrical regulations made pursuant to the Safety Codes Act specifies wiring requirements for Class I, II and III hazardous locations. The regulations also provide specific requirements for areas where flammable or combustible liquids are stored or dispensed and wiring requirements for areas where corrosive liquids or vapours or excessive moisture are present.

**A-5.1.5.1.(5)** CAN/CSA-Z731, "Emergency Planning for Industry," may provide information to assist in establishing a fire safety plan.

**A-5.3.1.3.(2)** NFPA standards on dust explosions include:

NFPA 61, "Prevention of Fires and Dust Explosions in Agricultural and Food Products Facilities,"  
 NFPA 65, "Processing and Finishing of Aluminum,"  
 NFPA 91, "Exhaust Systems for Air-Conveying of Materials,"  
 NFPA 120, "Coal Preparation Plants,"  
 NFPA 480, "Storage, Handling and Processing of Magnesium,"  
 NFPA 481, "Production, Processing, Handling and Storage of Titanium,"  
 NFPA 482, "Production, Processing, Handling and Storage of Zirconium,"  
 NFPA 650, "Pneumatic Conveying Systems for Handling Combustible Materials,"  
 NFPA 651, "Manufacture of Aluminum and Magnesium Powder,"  
 NFPA 654, "Prevention of Fires and Dust Explosions in the Chemical, Dye, Pharmaceutical and Plastics Industries,"  
 NFPA 655, "Prevention of Sulfur Fires and Explosions,"  
 NFPA 664, "Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities."

**A-5.3.3.2.(2)** A conveyor belt having a surface resistivity of less than 300 megaohms is considered to provide protection against electrostatic charge accumulation in a grain handling facility.

**A-5.4.3.1.(1)** Although partial sprinkler systems and other automatic fire suppression systems installed only in the spray booth and spray area can be overtaxed by a fire developing outside of the protected area, they do have a limited value in protecting the rest of the building against a fire starting within the protected area. Partial sprinkler systems in otherwise unsprinklered buildings shall be designed and installed in conformance with the ABC.

**A-6.1.1.2.(1)** Both the ABC and the AFC assume that all fire protection features of a building, whether required by Code or voluntarily installed, will be designed in conformance with good fire protection engineering practice and will meet the appropriate installation requirements in relevant standards. Such good design is necessary to ensure that the level of public safety established by the Code requirements is not reduced by a voluntary installation. Thus, a voluntarily installed system should be maintained in operating condition, at least to the extent that it was originally intended to function, in conformance with the applicable installation standards.

**A-6.1.1.3.(5)** Water supply systems, whether municipally or privately owned, form an essential component of most fire suppression systems. When planning fire fighting strategies and tactics, fire departments place a great deal of reliance on an adequate and dependable supply of water.

The responsibility for the inspection and maintenance of these water supply systems often rests with persons outside the control of the fire department. In many cases, the system is maintained and serviced by a water works or engineering department or by an outside agency.

No matter who is responsible for the system, it is essential that the agencies develop a cooperative approach and that they work together to ensure the best possible protection for the public. Failure to notify the fire department that a hydrant is out of service or that a water main has broken can cause delays which may result in the loss of lives or excessive damage to property. Such neglect may also expose a municipality or an individual to litigation which could otherwise be avoided.

**A-6.1.1.4.(1)** Interruption of normal operation of a fire protection system for any purpose constitutes a "temporary shutdown." Types of interruptions include, but are not limited to, periodic inspection or testing, maintenance, and repairs. During a shutdown, alternative measures are necessary to ensure that the level of safety intended by the Code is maintained.

In the shutdown of a fire alarm system, alternative measures should be worked out in cooperation with the fire department to ensure that all persons in the building can be informed promptly, and the fire department notified, if a fire should occur while the alarm system is out of service.

When a sprinkler system is shut down, measures that can be taken include the provision of: emergency hose lines and portable extinguishers, extra fire watch service and, where practicable, temporary water connections to the sprinkler system.

**A-6.1.1.6.(1)** Persons are considered qualified in the installation and maintenance of lightning protection systems when they have knowledge and training in the application of CAN/CSA-B72, "Installation Code for Lightning Protection Systems."

**A-6.1.1.6.(2)(a)** Persons are considered qualified in the maintenance of special fire suppression systems when:

- (a) they have acquired a certificate of training from a public post secondary educational institution,

## A-6.1.1.6.(2)(b)

- (b) they comply with the ULC "Certificate Service for the Installation and Servicing of Fire Suppression Systems." Recognizing persons certified under the ULC program restricts the individual to performing maintenance only on those systems for which they have a current manufacturer's certificate, or
- (c) they have acquired a certificate of training from a manufacturer.

**A-6.1.1.6.(2)(b)** Persons are considered qualified in the maintenance of fire alarm and detection systems when they have acquired a certificate of training from a public post secondary educational institution, the International Brotherhood of Electrical Workers (IBEW) or from the Canadian Fire Alarm Association (CFAA).

**A-6.1.1.6.(2)(c)** Persons are considered qualified in the maintenance of portable fire extinguishers when:

- (a) they have acquired a certificate of training from a public post secondary educational institution, and
- (b) they own or are employed by an agency that is certified by a recognized testing agency.

**A-6.2.1.2.(1)** It is not the intent of this Article to restrict the use of pump tank extinguishers selected and installed in accordance with NFPA 10, "Portable Fire Extinguishers." This type of extinguisher is used extensively throughout the province in apartment buildings, welding shops, schools, hospitals and offices and is considered to be effective in this type of application. The extinguisher is relatively easy to inspect, refill and maintain. Its continued use, when selected, installed and maintained in accordance with NFPA 10 is considered acceptable.

**A-6.2.1.3.(2)** Prominent cautionary labels on portable extinguishers, warning signs at entry points to confined spaces, provisions for remote applications, special nozzles, special ventilation, provision of breathing apparatus and other personal protective equipment and adequate training of personnel are among measures to be considered to minimize hazards.

**A-6.2.2.1.(1)** Certain combustible metals and reactive chemicals require special extinguishing agents or techniques. NFPA 49, "Hazardous Chemicals Data" can be used as a guide regarding such agents or techniques. Chemical reactions between burning metals and many extinguishing agents may cause explosions or increase the intensity of the fire, depending on the type, form and quantity of metal involved and the extinguishing agent used.

Extinguishers equipped with metal extensions are not considered safe for use on fires in energized

electrical equipment and, therefore, should not be used for fighting Class C fires.

**A-6.2.3.1.** The anticipated rate of fire spread, the intensity and rate of heat development, the smoke contributed by the burning materials and the approachability of a fire with portable extinguishers are factors that are taken into consideration. Wheeled extinguishers contain additional agent, have greater range and provide additional protection where this is needed.

**A-6.3.1.5.(2)** Sentence 6.3.1.5.(2) is intended to ensure that a voice communication system which would not be tested as part of an associated fire alarm system, but which will be relied upon during a fire emergency, will be tested periodically.

**A-6.4.1.1.(1)** Standpipe and hose systems that incorporate the use of pressure reducing valves, installed in accordance with NFPA 14, "Installation of Standpipe and Hose Systems," should be inspected in accordance with NFPA 25, "Inspection, Testing and Maintenance of Water-Based Fire Protection Systems," Section 3-3.1, to ensure they are correctly located on appropriate floors and will provide the required flows and pressures.

**A-6.4.1.6.(1)** NFPA 14 "Installation of Standpipe and Hose Systems" requires an initial flow test to be conducted at the hydraulically most remote outlet on any new standpipe system. A similar test should be conducted every five years to ensure that the design flow can be delivered at the required residual pressure at the topmost outlet. This may require installation of a valved test connection near the top of the standpipe riser, as well as special arrangements to stop traffic to permit hose streams to be discharged to the street. On existing standpipe systems, where a flow test from the hydraulically most remote outlet may not be practical, an appropriate location for the test should be selected in consultation with the authority having jurisdiction. This requirement does not apply to dry standpipes whose only water supply is by mobile pumping apparatus.

**A-6.5.1.1.(1)** This reference to the ABC is intended to lead primarily to Subsection 3.2.5., "Provisions for Fire Fighting." Articles in that Part which specifies the appropriate standard for design and installation of automatic sprinkler systems (NFPA 13) and provides for several exceptions or supplementary requirements. On occasion, other pertinent provisions in the ABC may apply. However, where a specific hazard is not addressed by the ABC, such as high piled storage, or storage of flammable and combustible liquids or rubber tires, the AFC directly references the applicable NFPA standards for design criteria for the sprinkler system.

**A-6.5.1.5.(1)** Partitions, racks, or products stored on shelves or in piles should be kept far enough away from sprinklers so that they will not interfere with the discharge pattern. NFPA 13, "Installation of Sprinkler Systems" sets the standard for minimum clearances from obstructions.

**A-6.5.1.7.(1)** The ABC permits the use of plastic sprinkler piping for wet pipe sprinkler systems in residential and other light hazard occupancies. Subsection 3.2.5. of the ABC specifies criteria for protecting plastic sprinkler pipe so that no length of pipe could be exposed to open flame or heat without the protection of a nearby sprinkler, or fire resistive covering. Article 6.5.1.7. of the AFC ensures that the conditions specified in the ABC are maintained, including the limitation to light hazard occupancies, the location of openings in the protective membrane with respect to sprinklers, the use of steel suspension grids and proper weight individual ceiling tiles in suspended ceilings, and the integrity of fire protective covering construction.

**A-6.5.2.3.(1)** The manner in which closed sprinkler control valves are identified should also be apparent to the responding fire department.

**A-6.5.3.6.(1)** Velocities of approximately 3 m/s can be achieved by attaining flow rates as indicated in Table A-6.5.3.6.

**Table A-6.5.3.6.**  
**Recommended Minimum Flow Rates for Flushing**  
**Underground Water Supply Mains**

Size of Pipe, mm	Minimum Flow, L/min
100	1 500
150	3 250
200	5 800
250	9 000
300	13 000

**A-6.5.3.11.(1)** The normal water supply is determined by conducting a main drain test at the time of the original sprinkler installation. The static pressure is recorded, the main drain valve is opened wide under available pressure and the residual pressure is recorded. The difference between static and residual pressures at that time is the normal pressure drop. If pressure drops significantly greater than normal occur during subsequent main drain tests, the supply system should be investigated for the possibility of closed valves or other obstructions in the piping.

**A-6.5.4.4.(1)** Where a sprinkler system control valve has associated with it a drain valve of adequate size (50 mm), and the necessary pressure gauges, the drain test referred to is as described for

a "main drain test" in Appendix Note A-6.5.3.11.(1). However, for sectional control valves, such as occur on sprinkler piping for individual floors or zones in a multi-storey building, the drain valve for the piping in that zone may not be equivalent to a 50 mm "main drain," and the pressure gauges needed to conduct a proper main drain test may be absent. In the case of sectional control valves, the drain test intended involves opening the local drain valve and flowing water to ensure the sectional control valve has been fully reopened.

**A-6.5.4.12.(1)** Sprinklers in service frequently accumulate a deposit of dust, grease or other foreign material. Where these deposits are light, they often do not impair the proper operation of the sprinkler. Heavier deposits can often be removed by light cleaning methods. Where the deposits cannot readily be removed, and doubt exists with respect to the effects of the contamination, a sampling of the sprinklers should be removed and forwarded to a recognized testing laboratory for an assessment of their operational characteristics to determine the necessity of replacing other sprinklers in the system.

**A-6.6.3.2.(1)** The pump room temperature must be maintained in the range intended by the engine manufacturer, because the start-up performance of the engine may be greatly reduced at lower temperatures. The engine manufacturer may recommend the installation of water heaters and oil heaters when ambient temperatures could be less than 20°C. The temperature in the pump room can be lower for electric motor driven pumps, and 4°C is widely used as the minimum permissible temperature in valve rooms, during the most severe weather.

**A-6.6.3.3.(1)** An indication of the satisfactory performance of the controller can be obtained by starting the pump by reducing the water pressure in the controller sensing line. The operating conditions of the relief valve, and the discharge and suction pressures, lubricating oil levels, and priming water levels, are further indications of the performance of the fire pump and related equipment.

Centrifugal fire pumps should not be operated for prolonged periods under shut-off conditions, that is, with no water flowing from the system, or at very low rates of flow, because of the excessive wear on impellers due to cavitation, and on seals and thrust bearings due to the higher operating pressure and increased vibrations. Water should be discharged from the system if possible.

**A-6.7.1.5.(1)** This can be achieved by replenishment as the result of the routine test program required by Article 6.7.1.1.

**A-6.8.1.1.** Concern over the impact of halons on the environment is resulting in changes to the

## **A-7.2.1.1.(1)**

regulations of various agencies that affect their use and release to the atmosphere and the reduction, recycling and eventual phaseout of halon fire extinguishment agents. Standards referenced in the AFC may not reflect the status at any given time of requirements by other agencies regarding the installation, use and testing of fire suppression systems that employ halons.

**A-7.2.1.1.(1)** It is not intended that all equipment be tested on each test occasion. A representative number of devices may be tested on each occasion provided all equipment is tested within the time period agreed to in the fire safety plan.

**A-7.2.3.4.** In practice, the only way the owner can be realistically expected to maintain ventilation equipment properly is if he has a detailed record of all the equipment plus a description of its intended operation.

**A-7.3.1.1.(1)** The testing required in Section 7.3. is not intended to be a complete assessment of the design of the smoke control system, but only a test of the individual pieces of equipment specified.

**A-7.3.2.1.(2)** It is intended that 1/3 of the system is checked each year so that at the end of each three year period the entire system has been tested.

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## **Appendix B**

### **Safety Codes Act**





PROVINCE OF ALBERTA

## **SAFETY CODES ACT**

**Statutes of Alberta 1991, Chapter S-0.5  
with amendments in force as of December 9, 1999**

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### **OFFICE CONSOLIDATION**

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## NOTE

All persons making use of this consolidation are reminded that it has no legislative sanction, that the amendments have been embodied for convenience of reference only, and that the original Acts should be consulted for all purposes of interpreting and applying the law.

## REGULATIONS

The following is a list of the regulations made under the *Safety Codes Act* that are filed as Alberta Regulations under the *Regulations Act* as of the consolidation date shown on the cover:

	Alta. Reg.	Amendments
<b>Safety Codes Act</b>		
Administration and Information		
Systems .....	55/95	185/95
Administrative Items .....	83/94	292/94, 360/94, 141/95
Amusement Ride Standards .....	214/97	
Amusement Rides .....	270/89	203/92, 214/97
Authorization to Apply for		
a Permit .....	293/92	320/93, 229/94
Boilers and Pressure Vessels .....	293/94	
Building Code .....	50/98	
Building Permit .....	202/91	167/92, 302/93
Certification of Electrical		
Workers .....	60/82	233/87, 151/91, 201/92, 317/93
Codes and Procedures .....	177/92	216/97, 218/97
Design, Construction and Installation of		
Boilers and Pressure Vessels .....	227/75	75/78, 444/78, 260/80, 401/82, 354/84, 415/87, 157/90, 107/91, 344/92, 296/93, 294/94, 159/97
Electrical Code .....	208/99	
Electrical Permits and		
Inspection Fees .....	61/82	234/87, 150/91, 202/92, 316/93
Elevating Devices Code .....	216/97	276/98
Engineers' .....	319/75	76/78, 445/78, 402/82, 355/84, 158/90, 148/91, 345/92, 297/93, 295/94, 51/98
Exemption .....	199/96	99/98, 284/98, 168/99, 184/2000
Exemption Orders		
Boilers and Pressure Vessels .....	300/94	
Professional Seal Exemption .....	388/82	

Fire Code .....	52/98	
Gas Code .....	217/97	
Gas Permits and Inspection Fees .....	204/74	105/82, 553/82, 226/87, 153/91, 205/92, 318/93, 227/94
Gasfitter's Certification .....	149/79	106/82, 554/82, 11/84, 154/91, 206/92, 319/93, 228/94
General (Plumbing & Drainage) .....	210/92	294/92, 321/93, 230/94
Inclined Passenger Lifts .....	338/62	
Motor Vehicle Conversions and Inspections Permit .....	70/94	
Passenger Ropeways Standards .....	218/97	
Permit .....	186/95	
Plumbing Code .....	219/97	
Pressure Welders .....	229/75	77/78, 261/80, 403/82, 356/84, 48/86, 413/87, 159/90, 296/94
Private Sewage Disposal Systems .....	229/97	119/99
Rural Wiremen (Certification) .....	59/70	
Sprinkler Requirements .....	162/86	

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## SAFETY CODES ACT

### CHAPTER S-0.5

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HER MAJESTY, by and with the advice and consent of the  
Legislative Assembly of Alberta, enacts as follows:

## Interpretation

**1(1)** In this Act,

- (a) "accredited agency" means a person designated as an accredited agency under this Act;
- (b) "accredited corporation" means a corporation designated as an accredited corporation under this Act;
- (c) "accredited municipality" means a municipality that is designated as an accredited municipality under this Act;
- (c.1) "accredited regional services commission" means a regional services commission established under the *Municipal Government Act* that is designated as an accredited regional services commission under this Act;

- (d) "Administrator" means an Administrator appointed under this Act;
- (e) "building" includes a structure and any part of a building or structure but does not include any thing excluded by the regulations from the definition of building;
- (f) "construction" includes alteration, installation, repair, relocation, demolition and removal;
- (g) "contractor" means a person or organization that does or undertakes to do, either for his own use or benefit or for that of another, whether or not for the purposes of gain, any process or activity to which this Act applies;
- (h) "Council" means the Safety Codes Council established under this Act;
- (i) "design" includes plans, diagrams, drawings and specifications depicting the arrangement and operation of any thing, process or activity to which this Act applies;
- (j) "electrical system" means an assembly or any part of an assembly of electrical equipment or components used or intended to be used for the generation, transmission, distribution, control or utilization of electrical energy, but does not include any thing excluded by the regulations from the definition of electrical system;
- (k) "elevating device" means a passenger elevator, freight elevator, dumbwaiter, escalator, inclined passenger lift, manlift, passenger ropeway, freight platform lift, moving walk, personnel hoist, lift for persons with disabilities or amusement ride or any thing designated by the regulations as an elevating device;
- (l) "evaluation" includes load, destructive and non-destructive tests;
- (m) "fire protection" includes fire detection, prevention and suppression;
- (n) "gas" means any gas or compressed gas or any mixture or dilution of gases and includes any combustible or flammable fluid but does not include any gas, mixture or dilution of gases or combustible or flammable fluid excluded by the regulations from the definition of gas;
- (o) "gas system" means any equipment or installation used or intended to be used in or in conjunction with the processing, transmission, storage, distribution, supply or use of gas but does not include any thing excluded by the regulations from the definition of gas system;

(p) "information system" means the information system established under this Act;

(q) "local authority" means

(i) a council of a city, town, village, summer village or municipal district,

(ii) for the purposes of this Act, a settlement council of a Metis settlement,

(iii) a board of administrators of a new town, or

(iv) the Minister of Municipal Affairs, in the case of an improvement district or a special area;

(q.1) "Metis patented land" means patented land as defined in the *Metis Settlements Act*;

(r) "Minister" means the member of the Executive Council charged by the Lieutenant Governor in Council with the administration of this Act;

(s) "municipality" includes, for the purposes of this Act, a Metis settlement;

(t) "owner" includes a lessee, a person in charge, a person who has care and control and a person who holds himself out as having the powers and authority of ownership or who for the time being exercises the powers and authority of ownership;

(u) "person" includes a partnership and a band as defined in the *Indian Act* (Canada);

(v) "plumbing system" means the whole or any part of a drainage system, a venting system or a water system but does not include any thing excluded by the regulations from the definition of plumbing system;

(w) "pressure equipment" means a thermal liquid heating system and any containment for an expansible fluid under pressure, including, but not limited to, fittings, boilers, pressure vessels and pressure piping systems, as defined in the regulations;

(x) "private sewage disposal system" means a plant for the treatment and disposal of sewage, including a septic tank and absorption field, that is not connected to a municipal sewage disposal system;

(y) "quality management system" means all the documented,

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SAFETY CODES

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planned and systematic actions needed to ensure that this Act is complied with;

(z) "safety codes officer" means an individual designated as a safety codes officer under section 27;

(aa) "thermal liquid heating system" means one or more thermal liquid heaters in which a thermal liquid that is not pressurized by the application of a heat source is used as the heat transfer medium and includes any connected piping system or vessel;

(bb) "variance" means a variance issued under this Act;

(cc) "vendor" includes a lessor.

(2) In this Act, a reference to "this Act" includes the regulations and by-laws made under this Act and any code, standards or body of rules declared to be in force pursuant to this Act.

1991 cS-0.5 s1;1995 c24 s99(39);1998 c22 s40;1999 c26 s23

Application of  
Act

**2(1)** This Act applies to fire protection and applies to the design, manufacture, construction, installation, operation and maintenance of

(a) buildings,

(b) electrical systems,

(c) elevating devices,

(d) gas systems,

(e) plumbing and private sewage disposal systems, and

(f) pressure equipment.

(2) The Minister may, by order, exempt any person or municipality or any thing, process or activity from any or all provisions of this Act and attach terms and conditions to the exemption.

(3) An order under this section may be made to apply generally or specifically and to apply to all or a particular area of Alberta.

1991 cS-0.5 s2

Crown bound

**3** The Crown is bound by this Act.

1991 cS-0.5 s3

## PART 1

## RESPONSIBILITIES

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Government

**4** The Minister shall, in accordance with this Act, co-ordinate and encourage the safe management and control of any thing, process or activity to which this Act applies.

1991 cS-0.5 s4

Owners, care and control

**5** The owner of any thing, process or activity to which this Act applies shall ensure that it meets the requirements of this Act, that the thing is maintained as required by the regulations and that when the process or activity is undertaken it is done in a safe manner.

1991 cS-0.5 s5

Design duties

**6** A person who creates, alters, has care and control of or owns a design or offers a design for use by others shall ensure that the design complies with this Act and that it is submitted for review or registered if required by this Act, and if the design is deregistered, the person shall provide notice of its deregistration in accordance with the regulations.

1991 cS-0.5 s6

Manufacturers' duties

**7** A person who manufactures any thing or undertakes a process or activity to which this Act applies shall ensure that the thing, the process or the activity complies with this Act.

1991 cS-0.5 s7

Contractors' duties

**8** A contractor who undertakes construction, operation or maintenance of or builds or installs any thing to which this Act applies shall ensure that this Act is complied with.

1991 cS-0.5 s8

Vendors' duties

**9(1)** A person who is a vendor in the ordinary course of business, other than as an employee or an agent, shall not advertise, display or offer for sale, for lease or for other disposal, or sell, lease or otherwise dispose of, any thing to which this Act applies unless that thing complies with this Act.

**(2)** A person who sells, leases or otherwise disposes of a thing referred to in subsection (1) shall provide any warnings or instructions required by this Act.

**(3)** No person shall advertise, display or offer for sale, for lease or for other disposal, or sell, lease or otherwise dispose of, any thing that is prohibited from being sold by the regulations.

1991 cS-0.5 s9

Use of variances

**10(1)** An owner, vendor, contractor, manufacturer or designer of a thing, or a person who authorizes, undertakes or supervises any process or activity, to which a variance applies shall ensure that the terms and conditions of the variance are complied with.

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(2) Compliance with a variance is deemed to be compliance with this Act.

1991 cS-0.5 s10

Professional services

**11** A person permitted to affix stamps or seals pursuant to the *Architects Act* or the *Engineering, Geological and Geophysical Professions Act* shall ensure that any professional service he renders to which this Act applies, including the affixing of stamps and seals, complies with this Act.

1991 cS-0.5 s11

Liability exemption

**12(1)** No action lies against the Crown, the Council, members of Council, safety codes officers, accredited municipalities or their employees or officers, accredited regional services commissions or their employees or officers, accredited agencies or their employees or officers or Administrators for anything done or not done by any of them in good faith while exercising their powers and performing their duties under this Act.

(2) The Crown, an accredited municipality, an accredited regional services commission and an accredited agency acting in good faith under this Act are not liable for any damage caused by a decision related to the system of inspections, examinations, evaluations and investigations, including but not limited to a decision relating to their frequency and the manner in which they are carried out.

(3) The Crown and an accredited municipality and an accredited regional services commission that engage the services of an accredited agency are not liable for any negligence or nuisance of the accredited agency that causes an injury, loss or damage to any person or property.

(4) Subject to this section, nothing done pursuant to this Act affects the liability of any person for injury, loss or damage caused by any thing, process or activity to which this Act applies.

1991 cS-0.5 s12;1993 c7 s2;1999 c26 s23

## PART 2

### ADMINISTRATION

Overall administration

**13(1)** The Minister administers this Act but an accredited municipality, an accredited regional services commission and an accredited corporation shall provide for the administration of this Act in accordance with the order that designated it as an accredited municipality, accredited regional services commission or accredited corporation.

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(2) The Minister or the Council may, in accordance with the regulations, establish and operate safety information and education programs or services related to any thing, process or activity to which this Act applies.

1991 cS-0.5 s13;1999 c26 s23

## Administrator

Administrator  
appointed

**14(1)** The Minister may appoint persons as Administrators and prescribe their powers and duties and may make an order fixing or governing the terms and conditions of service, including remuneration and expenses, applicable to an Administrator if the person is not an employee as defined in the *Public Service Act*.

(2) The Minister may direct, in writing,

(a) that an Administrator report to the Council with respect to exercising the powers and performing the duties of an Administrator, and

(b) that the Council direct the Administrator in exercising the powers and performing the duties of an Administrator.

1991 cS-0.5 s14

Deemed an  
officer

**15** An Administrator may, in accordance with the appointment under section 14, exercise any or all of the powers and perform any or all of the duties of a safety codes officer.

1991 cS-0.5 s15

## Safety Codes Council

Council

**16(1)** There is hereby established a corporation to be known as the "Safety Codes Council".

**(1.1)** On the coming into force of this subsection, the Council shall consist of members appointed as follows:

(a) not more than 40% of the members shall be appointed by the Minister, and

(b) at least 60% of the members shall be appointed by the Co-ordinating Committee of the Safety Codes Council, established by a Council by-law.

(2) Among the persons appointed to the Council the Minister and the Committee shall include persons who are experts in fire protection, buildings, electrical systems, elevating devices, gas systems, plumbing systems, private sewage disposal systems or pressure equipment.

(3) The Minister and the Committee shall ensure that representatives of municipalities, business and labour are appointed to the Council from among the persons described in subsection (2).

(4) An Administrator is not eligible to be a member of the Council.

(5) The Minister shall designate one of the members of the Council to chair the Council and may designate others as alternates to chair the Council.

(6) A person appointed as a member of the Council

(a) holds office for a term not exceeding 3 years as prescribed in the appointment, and

(b) continues to hold office after the expiry of the term of office until the person is reappointed or a successor is appointed.

(7) If a member of the Council resigns or the appointment terminates, that person may, in relation to a proceeding in which the person participated as a member of the Council, perform and complete the duties or responsibilities and continue to exercise the powers that the person would have had if the person had not ceased to be a member, until that proceeding is completed.

1991 cS-0.5 s16;1993 c7 s3

Expenses

**17** The Council may pay members of the Council travelling and living expenses while away from their ordinary places of residence in the course of their duties as members of the Council at the rates provided for in the regulations under the *Public Service Act*.

1991 cS-0.5 s17;1993 c7 s4

Duties and powers

**18** The Council

(a) shall perform its duties and responsibilities under this Act,

(b) shall hear appeals under Part 5,

(c) shall, on the request of the Minister, provide information about any matter related to this Act,

(d) shall carry out any activities that the Minister directs,

(e) may promote uniformity of safety standards for any thing, process or activity to which this Act applies,

(f) may provide a liaison between the Minister and any person or organization interested in safety matters governed by this Act,

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(g) may review and formulate classifications of certificates of competency and qualifications required of a person to hold a certificate of competency,

(h) may, with the consent of the Minister, review and formulate codes and standards for accreditation and safety standards for any thing, process or activity to which this Act applies and promulgate those codes and standards, and

(i) may recommend to the Minister that it undertake to provide the Minister with advice on safety information, education programs and services, accreditation and other matters related to this Act and may, with the consent of the Minister, provide that advice.

1991 cS-0.5 s18

By-laws

**19(1)** The Council may make by-laws

(a) respecting sub-councils and committees of the Council and the delegation of any power or duty conferred or imposed on it, except the power to make by-laws, to a sub-council or committee of the Council or a member of the Council,

(b) governing the calling of its meetings and the meetings of the sub-councils and committees of the Council, and regulating the conduct of those meetings,

(c) governing the practice and procedure applicable to appeals before it, and

(d) governing the business, property, operation and affairs of the Council.

**(2)** A by-law under subsection (1) does not come into force unless it has been approved by the Minister.

1991 cS-0.5 s19

Staff

**20(1)** The Council may enter into agreements to engage the services of persons it considers necessary and may prescribe their duties and conditions of employment and pay their salary, remuneration and expenses.

**(2)** The Council may enter into agreements to engage the services of agents, advisors or persons providing special, technical or professional services of a kind required by the Council in connection with its business and affairs and may pay their remuneration, fees and expenses.

1991 cS-0.5 s20

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Money

**21(1)** The Council, in connection with the powers conferred and duties imposed on it under this Act, may acquire real property, construct buildings or improvements or hold or dispose of real property.

**(2)** The Council, in connection with the powers conferred and duties imposed on it under this Act, may acquire, hold and dispose of personal property.

**(3)** Any money that is derived from donations that is not immediately required for the operation of the Council may, subject to any trust or condition to which the money is subject, be invested in investments in which trustees are authorized to invest money under the *Trustee Act*.

**(4)** The Council may spend money only for purposes related to the powers conferred and duties imposed on it under this Act.

**(5)** Notwithstanding the *Financial Administration Act*, any money received by the Council belongs to the Council.

1991 cS-0.5 s21;1993 c7 s5

Fees

**21.1** The Council may establish and charge fees

(a) for anything issued or for any material, information, education program or service the Council provides,

(b) with respect to the conduct of appeals, and

(c) for any research that is carried out that relates to any thing, process or activity to which this Act applies.

1993 c7 s6

Levies

**21.2(1)** The Council may, with the approval of the Minister, for the purpose of enabling the Council to carry out activities and services it is directed or authorized to carry out under this Act, collect money by the levy of assessments on persons who apply for, or hold, certificates or permits or who apply to register, or register, designs.

**(2)** The Council may require an accredited municipality, accredited regional services commission, accredited corporation, accredited agency or other organization that issues certificates or permits or registers designs to collect the money referred to in subsection (1) and to remit it to the Council.

1994 c44 s2;1999 c26 s23

Levies

**21.3(1)** An accredited agency may, with the approval of the Minister, for the purpose of enabling the accredited agency to carry out activities and services it is directed or authorized to carry out under this Act, collect money by the levy of assessments on persons

who apply for, or hold, certificates or permits or who apply to register, or register, designs.

(2) An accredited agency may, with the approval of the Minister, require an accredited municipality, accredited regional services commission, accredited corporation, accredited agency or other organization that issues certificates or permits or registers designs, to collect the money referred to in subsection (1), and the accredited municipality, accredited regional services commission, accredited corporation, accredited agency or other organization shall collect the money and remit it as directed by the accredited agency.

1994 c44 s2;1999 c26 s23

## Reports

**22(1)** The Council shall, after the end of each fiscal year, prepare and submit to the Minister an annual report consisting of a general summary of its activities in that year and a financial report.

(2) The Council may, at any time, report to the Minister on any matter related to this Act.

(3) The Minister shall lay a copy of the report described in subsection (1) before the Legislative Assembly if it is then sitting, and if it is not then sitting, within 15 days after the commencement of the next ensuing sitting.

1991 cS-0.5 s22

## Accreditation

### Accredited municipalities

**23(1)** On the application of a local authority, the Minister may, by order,

(a) designate a municipality as an accredited municipality authorized to administer all or part of this Act with respect to any or all things, processes or activities to which this Act applies within the boundaries of the municipality, or

(b) designate 2 or more municipalities as accredited municipalities authorized to administer in common all or part of this Act with respect to any or all things, processes or activities to which this Act applies within the boundaries of those municipalities.

(2) The Minister may include terms and conditions in an order under this section.

(3) If the Minister, on reasonable and probable grounds, is of the opinion that an accredited municipality does not comply with the requirements of this Act or the terms and conditions of its designation, or that any thing, process or activity to be administered by the accredited municipality may constitute a serious danger to

persons or property, the Minister may

(a) request the local authority to take the action necessary to correct the situation;

(b) direct a safety codes officer appointed under section 29(1) to undertake the administration of this Act in that accredited municipality and to charge fees, in the amount provided for by the regulations,

(i) to the accredited municipality for any permit issued by the safety codes officer and for any material or service that is provided by the safety codes officer,

(ii) to the owner of a premises or place for any material or services provided by the safety codes officer, and

(iii) to the recipient of any permit issued by the safety codes officer;

(c) by order, cancel or suspend the municipality's designation as an accredited municipality.

(4) An order under this section shall be published in The Alberta Gazette.

(5) The Minister may delegate any or all of the Minister's powers under this section to the Council, and if the Council refuses to designate a municipality as an accredited municipality or cancels or suspends the designation of an accredited municipality, the municipality may appeal the refusal, cancellation or suspension to the Minister.

1991 cS-0.5 s23

Accredited  
regional  
services  
commission

**23.1(1)** On the application of a regional services commission established under the *Municipal Government Act*, the Minister may, by order, designate a regional services commission as an accredited regional services commission authorized to administer all or part of this Act with respect to any or all things, processes or activities to which this Act applies within the boundaries of its members.

(2) The Minister may include terms and conditions in an order under this section.

(3) If the Minister, on reasonable and probable grounds, is of the opinion that an accredited regional services commission does not comply with the requirements of this Act or the terms and conditions of its designation, or that any thing, process or activity to be administered by the accredited regional services commission may constitute a serious danger to persons or property, the Minister may

(a) request the board of directors of the accredited regional services commission to take the action necessary to correct the situation;

(b) direct a safety codes officer appointed under section 29(1) to undertake the administration of this Act on behalf of that accredited regional services commission and to charge fees, in the amount provided for by the regulations,

(i) to the accredited regional services commission for any permit issued by the safety codes officer and for any material or service that is provided by the safety codes officer,

(ii) to the owner of a premises or place for any material or services provided by the safety codes officer, and

(iii) to the recipient of any permit issued by the safety codes officer;

(c) by order, cancel or suspend the regional services commission's designation as an accredited regional services commission.

**(4)** An order under this section must be published in The Alberta Gazette.

**(5)** The Minister may delegate any or all of the Minister's powers under this section to the Council, and if the Council refuses to designate a regional services commission as an accredited regional services commission or cancels or suspends the designation of an accredited regional services commission, the regional services commission may appeal the refusal, cancellation or suspension to the Minister.

1999 c26 s23

Accredited  
corporations

**24(1)** On the application of a corporation an Administrator may, by order, designate it as an accredited corporation authorized to administer all or part of this Act with respect to any or all things, processes or activities to which this Act applies that are owned by or are under the care and control of the corporation.

**(2)** If an Administrator refuses to designate a corporation as an accredited corporation, the Administrator shall serve written notice of the refusal on the corporation.

**(3)** An Administrator may include terms and conditions and specify locations and facilities in an order under this section.

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(4) If an Administrator, on reasonable and probable grounds, is of the opinion that an accredited corporation does not comply with the requirements of this Act or with the terms and conditions of its designation, the Administrator may, by order, suspend or cancel the designation as an accredited corporation and shall serve the corporation with a written notice of the suspension or cancellation.

(5) A corporation may appeal to the Council in accordance with the Council's by-laws

(a) a refusal of designation as an accredited corporation, and

(b) a suspension or cancellation of a designation as an accredited corporation.

(6) An order under this section shall be published in The Alberta Gazette.

1991 cS-0.5 s24

Accreditation  
overlap

**25(1)** If an accredited municipality, an accredited regional services commission and an accredited corporation are authorized to administer the same part of this Act with respect to the same thing, process or activity at the same location, the Minister may direct whether the accredited municipality, the accredited regional services commission or the accredited corporation may administer this Act with respect to that thing, process or activity.

(2) If the Minister considers it expedient and in the public interest, the Minister may delegate the Minister's powers under this section to another individual.

1991 cS-0.5 s25;1999 c26 s23

Accredited  
agencies

**26(1)** On the application of a person an Administrator may by order designate the person as an accredited agency authorized to provide services pursuant to all or part of this Act with respect to any or all things, processes or activities to which this Act applies.

(2) If an Administrator refuses to designate a person as an accredited agency, the Administrator shall serve the person with a written notice of the refusal.

(3) An Administrator may include terms and conditions in an order under this section.

(4) An accredited agency may enter into an agreement with the Minister, an accredited municipality, an accredited corporation or another person approved by the Minister to provide services under this Act that the agency is authorized to provide.(5) If an Administrator, on reasonable and probable grounds, is of the opinion that an accredited agency does not comply with the requirements of

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this or any other Act or with the terms and conditions of its designation, the Administrator may, by order, suspend or cancel the designation as an accredited agency and shall serve the agency with a written notice of the suspension or cancellation.

(6) A person may appeal to the Council in accordance with the Council's by-laws

(a) a refusal of designation as an accredited agency, and

(b) a suspension or cancellation of a designation as an accredited agency.

(7) An order under this section shall be published in The Alberta Gazette.

1991 cS-0.5 s26;1998 c24 s61

## Safety Codes Officers

Designation

**27(1)** On receipt of an application, an Administrator may designate a person who holds an appropriate certificate of competency and meets the requirements of the regulations as a safety codes officer with respect to all or part of this Act and may designate the powers that a safety codes officer may exercise.

(2) If an Administrator refuses to designate a person as a safety codes officer, the Administrator shall serve the person with a written notice of the refusal.

(3) If an Administrator, on reasonable and probable grounds, is of the opinion that a safety codes officer contravenes this Act or the terms of the person's designation as a safety codes officer, the Administrator may suspend or cancel the designation and shall serve the safety codes officer with a written notice of the cancellation or suspension.

(4) A safety codes officer may appeal to the Council a refusal of designation and a suspension or cancellation of a designation as a safety codes officer in accordance with the Council's by-laws.

1991 cS-0.5 s27

Officer's  
powers and  
duties

**28** A safety codes officer may exercise the powers and duties of a safety codes officer only in accordance with the designation under section 27 and the safety codes officer's terms of employment.

1991 cS-0.5 s28

Employment

**29(1)** In accordance with the *Public Service Act*, there may be appointed safety codes officers for the administration of all or part of this Act anywhere in Alberta.

(2) A local authority shall provide for safety codes officers for the purpose of administering all or part of this Act that an accredited municipality is authorized to administer.

(2.1) An accredited regional services commission shall provide for safety codes officers for the purpose of administering all or part of this Act that it is authorized to administer.

(3) An accredited corporation shall provide for safety codes officers for the purpose of administering all or part of this Act that it is authorized to administer.

(4) An accredited agency shall provide for safety codes officers for the purposes of providing services under this Act that it is authorized to provide.

1991 cS-0.5 s29;1999 c26 s23

## Inspections

**30(1)** For the purpose of ensuring that this Act and any thing issued under this Act are complied with, a safety codes officer may, without a warrant, at any reasonable time, enter any premises or place, except a private dwelling-place that is in use as a dwelling, in which the officer has reason to believe there is something to which this Act applies and may, using reasonable care, carry out an inspection, review designs and examine and evaluate quality management systems and manufacturing and construction processes.

(2) For the purpose of ensuring that this Act and any thing issued under this Act are complied with, a safety codes officer may, at any reasonable time and on reasonable notice, enter a private dwelling-place that is in use as a dwelling in which the officer has reason to believe there is something to which this Act applies and, using reasonable care, may carry out an inspection and review designs

(a) with the consent of the owner or occupant, or

(b) with a warrant from a justice.

(3) On entering a premises or place a safety codes officer shall, on request, produce identification in accordance with the regulations and provide advice on the powers to carry out inspections, review designs and examine and evaluate quality management systems and manufacturing and construction processes.

(4) In carrying out an inspection, review, examination or evaluation under this Act, a safety codes officer may (a) be accompanied by any person or thing that the safety codes officer considers would be of assistance,

(b) inspect, review, examine and evaluate any thing, process

or activity to which this Act applies and photograph or otherwise record any thing, process or activity that the safety codes officer considers would be of assistance,

(c) require any person on the premises or at the place to be interviewed and to make full disclosure either orally or in writing about any matter concerning any thing, process or activity to which this Act applies,

(d) if necessary for safety reasons and on providing notice when practical, temporarily close or disconnect, or require temporary closure or disconnection of, any thing, process or activity to which this Act applies for the purpose of making the inspection, review, examination or evaluation, and

(e) review, perform or require to be performed any tests and evaluations the safety codes officer considers necessary on any thing, process or activity to which this Act applies and remove any thing, if necessary, for the purpose of having tests or evaluations performed.

(5) The owner or occupier of premises or a place or thing shall ensure, during an inspection, review, examination or evaluation, that

(a) on the request of a safety codes officer, there is a person in attendance who is capable of taking all the necessary precautions and providing reasonable assistance to ensure the safety of the safety codes officer, and

(b) any necessary safety equipment, including but not limited to that requested by a safety codes officer, is immediately available for the officer's use.

(6) A safety codes officer who has reviewed, detained or removed any thing shall, on completion of the inspection, review, examination or evaluation, return the thing to the person entitled to it unless it is impossible, unsafe or impractical to return that thing.

(7) On completion of an inspection, review, examination or evaluation the safety codes officer may provide, to the owner, occupier, vendor, contractor, manufacturer or designer, advice or a report on the thing, process or activity that was inspected, reviewed, examined or evaluated.

(8) Notwithstanding subsection (6), a safety codes officer may,

(a) on obtaining a warrant, or

(b) without a warrant if the safety codes officer believes on reasonable and probable grounds that it is not practical to obtain a warrant because the necessary delay may result in

the loss of evidence,

detain or remove for the purposes of evidence any thing that the officer discovers during an inspection, review, examination or evaluation that the officer believes on reasonable and probable grounds may provide evidence of the commission of an offence under this Act.

1991 cS-0.5 s30

Production of documents

**31(1)** For the purpose of ensuring that this Act and any thing issued under this Act are complied with, a safety codes officer may demand the production, within a reasonable time, of any record or document pertaining in any manner to compliance with this Act and may on giving a receipt for it remove it for not more than 48 hours for the purpose of making copies of it.

**(2)** If a person on whom a demand is made under subsection (1) refuses or fails to comply, the safety codes officer may apply to a judge of the Court of Queen's Bench by way of originating notice and the judge may make any order that the judge considers necessary to enforce compliance with subsection (1).

**(3)** A copy of the originating notice and a copy of each affidavit in support shall be served not less than 3 days before the day named in the notice for hearing the application.

1991 cS-0.5 s31

Incriminating disclosures

**32** A person who makes a disclosure under section 30(4)(c) has the right not to have any incriminating disclosure so given used to incriminate him in a prosecution under this Act except in a prosecution under section 63(2).

1991 cS-0.5 s32

Officer hindered

**33(1)** If a person refuses to allow a safety codes officer to exercise his powers under this Act or interferes or attempts to interfere with a safety codes officer in the exercise of his powers under this Act, an Administrator, accredited municipality or accredited regional services commission may apply to the Court of Queen's Bench by way of originating notice for an order

(a) restraining that person from preventing or in any manner interfering with a safety codes officer in the exercise of his powers under this Act, and

(b) for the purposes of providing protection, authorizing a police officer to accompany the safety codes officer on an inspection, review, examination or evaluation under this Act.

**(2)** A copy of the originating notice and a copy of each affidavit in

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support shall be served not less than 3 days before the day named in the notice for hearing the application.

1991 cS-0.5 s33;1999 c26 s23

## PART 3

### STANDARDS

Variances

**34(1)** An Administrator or a safety codes officer may issue a written variance with respect to any thing, process or activity to which this Act applies if the Administrator or officer is of the opinion that the variance provides approximately equivalent or greater safety performance with respect to persons and property as that provided for by this Act.

**(2)** An Administrator or a safety codes officer may include terms and conditions in the variance.

**(3)** A safety codes officer on issuing a variance shall notify an Administrator.

**(4)** The *Regulations Act* does not apply to variances issued under this section.

1991 cS-0.5 s34

Quality management system

**35(1)** An owner, occupier, vendor, contractor, manufacturer or designer of a thing, or a person who authorizes, undertakes or supervises a process or activity, to which this Act applies may be required by a written order of an Administrator or by this Act to have and maintain a quality management system that meets the requirements of the regulations.

**(2)** No person shall make a change to a quality management system without first notifying an Administrator of the change if it is a type of change of which an Administrator requires notification.

**(3)** A person who has or maintains a quality management system shall, on the request of an Administrator or a safety codes officer, make available a copy of a written description of the quality management system and submit reports respecting the quality management system.

1991 cS-0.5 s35

Design registration

**36(1)** An Administrator may register the design of any thing, process or activity that is required by this Act to be registered if the submitted design meets the requirements of this Act and the Administrator is of the opinion that the design is safe.

**(2)** If this Act requires that the design of any thing, process or

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activity be registered, no person shall construct or manufacture the thing or undertake or operate the process or activity unless the design is registered.

(3) If an Administrator refuses to register a design, the Administrator shall serve the applicant with a written notice of the refusal.

(4) If an Administrator is of the opinion that a registered design is not safe or is obsolete, the Administrator may deregister the design and shall as soon as practicable notify the person who submitted the design for registration.

(5) If a person's application to have a design registered is refused or if a person's registered design is deregistered, the person may appeal the refusal or deregistration to the Council in accordance with the Council's by-laws.

1991 cS-0.5 s36;1994 c44 s3

Certificate  
required

**37(1)** No person shall, without a certificate of competency, control or operate any thing to which this Act applies or supervise, operate or undertake any process or activity to which this Act applies if this Act requires that the person hold a certificate of competency to do so.

(2) No person shall employ or authorize a person who does not hold a certificate of competency to control or operate any thing or to supervise, operate or undertake a process or activity if this Act requires that an employed or authorized person hold a certificate of competency.

1991 cS-0.5 s37

Certificate  
issues

**38(1)** On receipt of an application, an Administrator may issue a certificate of competency to a person who complies with the requirements of this Act.

(2) A certificate of competency is valid for the length of time specified in it unless it is cancelled or suspended earlier.

(3) An Administrator may suspend or cancel a certificate of competency if the Administrator on reasonable and probable grounds is of the opinion that

- (a) the person no longer complies with the requirements of this Act for a certificate of competency, or
- (b) the person does not comply with this Act when acting pursuant to the certificate of competency.

(4) The Administrator shall serve written notice of a refusal to issue a certificate of competency or of the suspension or cancellation of a

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certificate of competency on the applicant for or the holder of the certificate of competency.

(5) A person who is refused a certificate of competency or whose certificate of competency is suspended or cancelled may appeal the refusal, suspension or cancellation to the Council in accordance with the Council's by-laws.

1991 cS-0.5 s38

Permits  
required

**39(1)** If this Act requires a person to have a permit to sell, construct, control or operate any thing or supervise, operate or undertake any process or activity, no person shall do so unless the person has the appropriate permit.

(2) If any thing to which this Act applies is approved by the regulations for a certain use or purpose, no person shall use that thing for any other use or purpose unless a safety codes officer issues a permit for that other use or purpose or it is an innocuous use or purpose.

(3) If the regulations require that any thing be approved before it is installed or operated, no person shall install or operate that thing unless a safety codes officer issues a permit for it.

(4) A permit under this Act does not authorize a person to do any thing, implement any process or engage in any activity that does not comply with any other enactment.

1991 cS-0.5 s39

Permit issues

**40(1)** On receipt of an application, a safety codes officer or other person designated by an Administrator may issue a permit to a person who complies with the requirements of this Act or issue a permit with respect to a thing, process or activity if it complies with the requirements of this Act.

(2) A safety codes officer or other person designated by an Administrator may include terms and conditions in a permit.

(3) If a safety codes officer or other person designated by an Administrator refuses to issue a permit, the safety codes officer or other person designated by an Administrator shall serve the applicant with a written notice of the refusal.

(4) A person who acts pursuant to a permit shall do so in accordance with this Act and shall comply with this Act and any terms or conditions contained in the permit.(5) A person who is refused a permit may appeal the refusal to the Council in accordance with the Council's by-laws.

1991 cS-0.5 s40;1994 c23 s42

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Stamps, seals

**41** If the regulations require the design of any thing, process or activity to which this Act applies to be submitted for review or registered and to have

(a) a stamp or seal affixed to it pursuant to the *Architects Act*, or

(b) a seal affixed to it pursuant to the *Engineering, Geological and Geophysical Professions Act*,

no permit may be issued with respect to the design unless the design is submitted for review or registered and is stamped and sealed in accordance with the regulations.

1991 cS-0.5 s41

Permit  
suspended,  
etc.

**42(1)** A safety codes officer may suspend or cancel a permit if the safety codes officer, on reasonable and probable grounds, is of the opinion that the permit holder does not comply with this Act when acting pursuant to the permit or that the thing, process or activity does not comply with this Act.

(2) The safety codes officer shall serve written notice of the suspension or cancellation on the permit holder and shall also notify an Administrator.

(3) A person whose permit is suspended or cancelled may appeal the suspension or cancellation to the Council in accordance with the Council's by-laws.

1991 cS-0.5 s42

## PART 4

### UNUSUAL SITUATIONS

Emergency

**43(1)** If a safety codes officer is, on reasonable and probable grounds, of the opinion that there is an imminent serious danger to persons or property because of any thing, process or activity to which this Act applies or because of a fire hazard or risk of an explosion, the officer may take any action that the officer considers necessary to remove or reduce the danger.

(2) An action taken under subsection (1) may include ordering the evacuation of persons from the affected premises and disconnecting or requiring the disconnection of an electrical, gas, sewage or plumbing system.

(3) A safety codes officer may request the assistance of a police officer when acting under subsection (1).

1991 cS-0.5 s43

Investigation

**44(1)** A safety codes officer may investigate an unsafe condition, accident or fire to determine its cause and circumstances and make recommendations related to safety.

**(2)** For the purposes of investigating an unsafe condition, accident or fire a safety codes officer may whenever necessary

(a) exercise any of the powers of a safety codes officer under sections 30 and 31, and

(b) for 48 hours or any extended period of time authorized by a justice, close all or part of the affected premises and prohibit any person from entering or remaining on the closed premises except a police officer or a person who enters to prevent injury or death or to preserve property if, in the opinion of the safety codes officer, there are dangerous or emergency circumstances and the action is necessary for safety reasons or to preserve evidence.

**(3)** A safety codes officer shall, as soon as possible after the completion of the investigation, return to the person entitled to it any thing removed during the investigation unless it is impossible, unsafe or impractical to return that thing.

**(4)** A safety codes officer who conducts an investigation shall provide a report to an Administrator.

1991 cS-0.5 s44

## PART 5

### ORDERS, APPEALS

Order

**45(1)** A safety codes officer may issue an order if the safety codes officer believes, on reasonable and probable grounds, that

(a) this Act is contravened, or

(b) the design, construction, manufacture, operation, maintenance, use or relocation of a thing or the condition of a thing, process or activity to which this Act applies is such that there is danger of serious injury or damage to a person or property.

**(2)** An order may be issued to a person who provides services that are the subject-matter of the order or to the owner, occupier, vendor, contractor, manufacturer or designer of the thing or to the person who authorizes, undertakes or supervises the process or activity that is the subject-matter of the order, or may be issued to any 2 or more of them.

**(3) An order**

(a) shall set out what a person is required to do or to stop doing in respect of the thing, process or activity and a reasonable time within which it must be done or stopped;

(b) may direct a method of work, construction, manufacturing, operation, maintenance, use or relocation that must be followed;

(c) may direct that the use of the thing, process or activity be stopped in whole or in part in accordance with the order;

(d) may direct that a design be altered;

(e) may direct that an altered design be submitted to an Administrator for review or for registration;

(f) may direct compliance with this Act, a permit, a certificate or a variance;

(g) shall meet the requirements of the regulations on format and contents.

**(4)** On issuing an order, the safety codes officer shall serve a copy on the person to whom it is issued in accordance with the regulations and send a copy of it to an Administrator in a form and within the time satisfactory to the Administrator.

**(4.1)** A person who is served with an order under subsection (4) may, within 14 days of being served, submit a written request to the Administrator for a review of the order.

**(5)** If an Administrator receives a request, in accordance with subsection (4.1), from a person on whom an order is served and if the Administrator considers that the order

(a) is improper, impractical or unreasonable,

(b) contains incorrect references or typographical errors, or

(c) does not correct or satisfy concerns about safety,

the Administrator may, by order, revoke or vary the original order within 21 days of when the original order was served.

**(6)** If an Administrator issues an order under subsection (5), the Administrator shall serve it, in accordance with the regulations, on all the persons on whom the original order was served and on the safety codes officer who issued the original order.

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1991 cS-0.5 s45;1999 c26 s23

Appeal of  
orders

**46(1)** A person to whom an order is issued may, if the person objects to the contents of the order, appeal the order to the Council in accordance with the Council's by-laws within 35 days of the date the order was served on the person.

**(2)** The Council, on receipt of a notice of appeal, shall send a copy to an Administrator and also to an accredited municipality or accredited regional services commission if the subject-matter of the order is administered by the accredited municipality or accredited regional services commission, and the Council shall notify the Administrator and appellant and the accredited municipality or accredited regional services commission of the time and place of the appeal.

**(3)** An appeal may proceed under this section regardless of whether a request was made in accordance with section 45(4.1).

1991 cS-0.5 s46;1999 c26 s23

Appeal of  
refusals,  
suspensions,  
cancellations

**47(1)** The Council, on receipt of a notice of appeal with respect to

(a) a refusal to designate a corporation as an accredited corporation or a person as an accredited agency,

(b) a refusal to register a design or a deregistration of a design, or

(c) a suspension or cancellation of a designation of accreditation, a certificate of competency or a permit,

shall send a copy of the notice of appeal to the relevant Administrator and the safety codes officer, if any, who issued the suspension or cancellation, and notify them and the appellant of the time and place of the appeal.

**(2)** In order for an appeal to proceed, the Council must receive a notice of appeal within 30 days of the date the corporation or person was served with the written notice of the refusal to designate, refusal to register, deregistration, suspension or cancellation.

1991 cS-0.5 s47

Council  
considers  
appeal

**48(1)** When the Council is considering an appeal,

(a) it may, at the direction of the person who chairs the Council or in accordance with the Council's by-laws, sit in one or more divisions, and the divisions may sit simultaneously or at different times;

(b) 3 members constitutes a quorum of a division of the Council;

(c) an order of a division is an order of the Council and binds all members of the Council;

(d) evidence may be given before the Council in any manner the Council considers appropriate and the Council is not bound by the rules of law respecting evidence applicable to judicial proceedings.

**(2) The Council may by order**

(a) confirm, revoke or vary an order, suspension or cancellation appealed to it and as a term of its order may issue a written variance with respect to any thing, process or activity related to the subject-matter of the order if in its opinion the variance provides approximately equivalent or greater safety performance with respect to persons and property as that provided for by this Act,

(b) confirm a refusal or direct that a designation, certificate or permit be issued and direct the inclusion of terms and conditions in the designation, certificate or permit, or

(c) confirm a deregistration of a design, confirm a refusal to register a design or direct that a design be submitted for review or be registered and that changes be made to the design before it is submitted for review or is registered.

**(3) The Council may include terms and conditions in a variance and shall, on issuing a variance, notify an Administrator.**

**(4) The *Regulations Act* does not apply to a variance issued under this section.**

**(5) The Council shall serve a copy of its order on the appellant and the Administrator and on the accredited municipality, accredited regional services commission and safety codes officer if they were sent a copy of the notice of appeal.**

1991 cS-0.5 s48;1999 c26 s23

Appeal to  
Court

**49(1) An appeal lies from an order of the Council to the Court of Queen' s Bench only on a question of law or jurisdiction.**

**(2) An appeal under this section may be commenced within 30 days after receipt of service of the Council' s decision**

(a) by filing an originating notice with the clerk of the Court, and

(b) by serving a copy of the originating notice

(i) on the Council if the appellant is the person to whom the order under appeal is directed, or

(ii) on the Council and on the person to whom the order under appeal is directed if the appellant is an Administrator, accredited municipality or accredited regional services commission.

(3) The Court may, on application either before or after the time referred to in subsection (2), extend that time if it considers it appropriate to do so.

(4) The Court may, in respect of an appeal under subsection (2),

(a) determine the issues to be resolved on the appeal, and

(b) limit the evidence to be submitted by the Council to a copy of the Council's decision certified by the person who was the chair when the appeal was heard and those materials necessary for the disposition of those issues.

(5) On hearing the appeal, the Court may confirm, revoke or vary the order of the Council.

1991 cS-0.5 s49;1999 c26 s23

Stay pending  
appeal

**50(1)** An appeal taken under section 46 or 47 does not operate as a stay of the order, suspension or cancellation appealed from unless a person who may chair the Council, on receipt of a written application, so directs.

(2) An appeal taken under section 49 does not operate as a stay of the order of the Council unless a judge of the Court of Queen's Bench so directs.

(3) A stay directed under this section may include terms and conditions and shall be in writing.

1991 cS-0.5 s50

Enforcement  
of order

**51(1)** A safety codes officer appointed under section 29(2) or (2.1), together with any person who is necessary, may enter, at any reasonable time, any premises or place for the purpose of carrying out an order unless the owner refuses to allow or interferes with the entry or the carrying out of an order

(a) if a person to whom the order is issued under section 45, 48 or 49 with respect to any thing, process or activity under the administration of an accredited municipality or accredited regional services commission does not commence

an appeal of the order within the time set out for the commencement of the appeal and the order is not carried out within the time set out in the order, and

(b) if the owner of the land concerned as registered under the *Land Titles Act* or, in the case of Metis patented land, the settlement member registered in the Metis Settlements Land Registry as owner of the Metis title, provisional Metis title or an allotment in the land has been given written notice of the intention of the accredited municipality or accredited regional services commission to carry out the order.

(2) When an order is carried out under subsection (1) in respect of land that is not Metis patented land, the local authority may place the amount of the expenses incurred in carrying out the order on the tax roll as an additional tax against the land concerned, and that amount

(a) forms a lien on the land in favour of the municipality, and

(b) is, for all purposes, deemed to be taxes imposed and assessed on the land and in arrears under the *Municipal Government Act* from the date the amount was placed on the tax roll, and that Act applies to the enforcement, collection and recovery of the amount.

(3) When an order is carried out under subsection (1) in respect of Metis patented land, the settlement council may place the amount of the expenses incurred in carrying out the order on the tax roll as an additional tax against the land concerned, and that amount is, for all purposes, deemed to be taxes imposed and assessed on the land and in arrears under the *Metis Settlements Act* from the date the amount was placed on the tax roll, and that Act applies to the enforcement, collection and recovery of the amount.

(4) In addition to the power granted under subsection (3), when an order is carried out under subsection (1) in respect of Metis patented land, the settlement council may record a notification of the amount of the expenses incurred in carrying out the order in the Metis Settlements Land Registry against the Metis title, provisional Metis title or an allotment in the land, and

(a) the expenses are a debt due to the Metis settlement by the settlement member who is registered as owner of the Metis title, provisional Metis title or allotment, and

(b) no dealings in respect of the land by the settlement member may be recorded in the Registry without the consent of the settlement council until the recording of the notification is cancelled.

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(5) A Metis settlement may, in addition to the rights under this section, exercise any rights granted under a General Council Policy to collect the expenses incurred in carrying out an order under subsection (1) that are payable by a settlement member.

1991 cS-0.5 s51;1994 cM-26.1 s642(64);1998 c22 s40;1999 c26 s23

Enforcement  
of order

**52(1)** An Administrator or a safety codes officer appointed under section 29(1) and designated by the Administrator, together with any person who is necessary, may enter, at any reasonable time, any premises or place for the purpose of carrying out an order unless the owner refuses to allow or interferes with the entry or the carrying out of an order

(a) if a person to whom an order is issued under section 45, 48 or 49 with respect to a subject-matter that is not under the administration of an accredited municipality or an accredited regional services commission does not commence an appeal of the order within the time set out for the commencement of the appeal, and the order is not carried out within the time set out in the order, and

(b) if the owner of the land concerned as registered under the *Land Titles Act* or, in the case of Metis patented land, the person registered in the Metis Settlements Land Registry as owner of the Metis title, provisional Metis title or an allotment in the land and the persons named by the Minister under subsection (2) have been given written notice of the intention to carry out the order.

(2) When an order is carried out under subsection (1), the amount of expenses incurred in carrying out the order is a debt due to the Crown jointly and severally by the persons named by the Minister prior to the carrying out of the order, but those persons may only include

(a) the owner of the land concerned as registered under the *Land Titles Act*,

(b) in the case of Metis patented land, the person registered in the Metis Settlements Land Registry as owner of the Metis title, provisional Metis title or an allotment in the land, and

(c) the persons to whom the order was issued.

(3) The Minister may delegate any or all of the Minister's powers under this section to the Council.

1991 cS-0.5 s52;1998 c22 s40;1999 c26 s23

Order of the  
Court

**53(1)** If a person refuses to allow an Administrator or a safety codes officer or a person lawfully accompanying either of them to carry out

an order under section 51 or 52 or interferes with or attempts to interfere with the carrying out of that order, the Administrator, accredited municipality or accredited regional services commission, as the case may be, may, whether or not that person has been prosecuted under section 63(1) or 63(4)(c) or (d), apply to the Court of Queen's Bench by way of originating notice for an order

(a) requiring that person to comply with the order issued under this Act, or

(b) restraining that person from interfering in any manner with the carrying out of an order in accordance with section 51 or 52.

(2) A copy of the originating notice and each affidavit in support shall be served not less than 3 days before the day named in the notice for the hearing or within such shorter time as the Court may direct.

1991 cS-0.5 s53;1999 c26 s23

## **PART 6**

### **INFORMATION**

Information  
system

**54** An Administrator or the Council may, in accordance with the regulations, maintain an information system with respect to any or all matters under this Act.

1991 cS-0.5 s54

Accident  
notification

**55** If there is an unsafe condition, accident or fire that involves a thing, process or activity to which this Act applies, the owner or person designated in the regulations shall, if required by the regulations, forthwith report it to an Administrator, or to the accredited municipality or accredited regional services commission if the thing, process or activity is under the administration of the accredited municipality or accredited regional services commission.

1991 cS-0.5 s55;1999 c26 s23

Information  
compilation

**56** If any information is required to be prepared, submitted or retained under this Act, the regulations and the terms and conditions of a permit may state the qualifications required to be held by the person who prepares, submits or retains it and may provide for how the information is to be prepared, submitted and retained.

1991 cS-0.5 s56

Outstanding  
orders

**57** If a person to whom an order is issued under this Act

(a) does not commence an appeal of the order within the time set out in this Act for commencement of an appeal, and

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(b) does not carry out the order within the time set out in the order,

an Administrator may place an entry on the information system that briefly indicates the subject-matter of the outstanding order, the name of the owner and the location of the thing, process or activity that is the subject-matter of the outstanding order.

1991 cS-0.5 s57

Variance register

**58** An Administrator may place an entry on the information system that briefly indicates the subject-matter of a variance and the location of the thing, process or activity to which the variance applies.

1991 cS-0.5 s58

Release of information

**59(1)** The Minister, members of the Council, Administrators, accredited municipalities, accredited regional services commissions, accredited corporations, accredited agencies, safety codes officers and any person employed in the administration of this Act shall preserve confidentiality with respect to all information and documents that come to their knowledge from employment in the administration of this Act except

(a) with the consent of the owner of the thing, process or activity that is the subject-matter of the information,

(b) if the information is published in statistical form whereby no place or premises is readily identified, unless the regulations authorize their identification,

(c) if the release of information or a document is required by an order of a court,

(d) if the release of information or a document is required by another Act,

(e) if the release of information or a document is authorized by this Act, or

(f) if the information

(i) concerns a permit,

(ii) is released by a public body as defined in the *Freedom of Information and Protection of Privacy Act*, and

(iii) is limited to the name of the permit holder and the nature of the permit.

**(1.1)** Notwithstanding subsection (1),

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(a) an accredited regional services commission must, on request by a municipality, release information to the municipality with respect to the administration of this Act within the municipality, and

(b) an accredited agency must, on request by a municipality, release information to the municipality with respect to the administration of this Act within the municipality.

(2) A person may request a search of the information system for variances and outstanding orders.

1991 cS-0.5 s59;1999 c26 s23;1999 c32 s18

## **PART 7**

### **GENERAL**

Fees

**60(1)** The Government may charge fees, in accordance with an order of the Minister,

(a) for anything issued or for any material, information, education program or service provided by the Minister under this Act, and

(b) for any research that is carried out by the Minister that relates to any thing, process or activity to which this Act applies.

(2) The Minister may make orders respecting the payment of fees to witnesses and interpreters and for reporting fires.

1991 cS-0.5 s60;1993 c7 s7

Regulations

**61(1)** The Lieutenant Governor in Council may make regulations

(a) governing fire protection and the safe design, manufacture, construction, sale, installation, use, operation, occupancy and maintenance of

(i) buildings,

(ii) electrical systems,

(iii) elevating devices,

(iv) gas systems,

(v) plumbing or private sewage disposal systems,

(vi) pressure equipment, and

(vii) fire protection systems and equipment;

- (b) respecting designs that require stamps or seals affixed by persons licensed or registered under the *Architects Act* or the *Engineering, Geological and Geophysical Professions Act* or any other enactment governing a profession or occupation;
- (c) respecting exclusions from the definitions of
  - (i) building,
  - (ii) gas,
  - (iii) electrical system,
  - (iv) gas system, and
  - (v) plumbing system,for the purposes of this Act;
- (d) respecting the designation of any thing as an elevating device;
- (e) defining for the purposes of this Act fittings, boilers, pressure vessels and pressure piping systems;
- (f) governing the qualifications and the evaluation of the qualifications of safety codes officers and applicants for and holders of permits and certificates of competency;
- (g) designating things, processes or activities with respect to which a certificate of competency or permit is required and establishing the classifications of certificates of competency and permits;
- (h) governing the issuance, display, making available, suspension, renewal and cancellation of permits and certificates of competency;
- (i) governing the provision of identification of safety codes officers and the use of the identification;
- (j) respecting forms for the purposes of this Act;
- (k) governing the information system and the release of information under section 59;
- (l) governing orders and the service of orders and notices;
- (m) governing the preparation, submission and retention of

reports and information and the reporting of unsafe conditions, accidents and fires;

(n) governing designs;

(o) governing quality management systems;

(p) governing accredited municipalities, accredited regional services commissions, accredited corporations and accredited agencies.

(2) If a code, standard or body of rules relating to

(a) fire protection,

(b) buildings,

(c) electrical systems,

(d) elevating devices,

(e) gas systems,

(f) plumbing or private sewage disposal systems,

(g) pressure equipment,

(h) classifications of and qualifications for certificates of competency,

(i) quality management systems, or

(j) accredited municipalities, accredited regional services commissions, accredited corporations or accredited agencies,

has been published by the Council or any association or person and copies are available, the Lieutenant Governor in Council may, in addition to or instead of any regulation he may make under subsection (1), by regulation declare the code, standards or rules to be in force either in whole or in part or with any variations that he specifies.

(3) The Minister shall ensure that the Council has the opportunity to review a proposed regulation for a period of 90 days prior to the regulation's being made unless the Council has waived or reduced the period of time.

(4) Regulations under this section may apply generally or specifically and may provide for which provision of which regulation prevails in the case of a conflict between the regulations.

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1991 cS-0.5 s61;1993 c7 s8;1994 c44 s4;1999 c26 s23

By-laws

**62(1)** A by-law of a municipality that purports to regulate a matter that is regulated by this Act is inoperative.

**(2)** Notwithstanding subsection (1), a municipality may make by-laws

(a) to carry out its powers and duties under the *Forest and Prairie Protection Act*;

(b) respecting minimum maintenance standards for buildings and structures;

(c) respecting unsightly or derelict buildings or structures.

**(3)** Notwithstanding subsection (1), an accredited municipality may make by-laws

(a) respecting fees for anything issued or any material or service provided pursuant to this Act, and

(b) respecting the carrying out of its powers and duties as an accredited municipality.

1991 cS-0.5 s62;1994 cM-26.1 s642(64)

## Prohibitions

Offences

**63(1)** A person who interferes with or in any manner hinders an Administrator or a safety codes officer in the exercise of his powers and duties under this Act is guilty of an offence.

**(2)** A person who knowingly makes a false or misleading statement under section 30(4)(c) either orally or in writing is guilty of an offence.

**(3)** A person who fails to prepare, submit or retain any information that he is required by this Act to prepare, submit or retain is guilty of an offence.

**(4)** A person who

(a) contravenes this Act,

(b) contravenes a condition in a permit, certificate or variance,

(c) contravenes an order, or

(d) fails to carry out any action required in an order to be taken within the time specified in it,

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is guilty of an offence.

1991 cS-0.5 s63

Penalty

**64(1)** A person who is guilty of an offence is liable

(a) for a first offence

(i) to a fine of not more than \$15 000 and, in the case of a continuing offence, to a further fine of not more than \$1000 for each day during which the offence continues after the first day or part of a day, or

(ii) imprisonment for a term not exceeding 6 months,

or to both fines and imprisonment, and

(b) for a 2nd or subsequent offence

(i) to a fine of not more than \$30 000 and, in the case of a continuing offence, to a further fine of not more than \$2000 for each day or part of a day during which the offence continues after the first day, or

(ii) to imprisonment for a term not exceeding 12 months,

or to both fines and imprisonment.

(2) If a person is guilty of an offence under this Act, the court may, in addition to any other penalty imposed or order made, order the person to comply with this Act or any order, permit, certificate or variance, or all or any one or more of them, as the case requires.

1991 cS-0.5 s64

Proof by  
certificate

**65** For the purposes of a prosecution for a contravention of any provision of this Act requiring a person to hold a certificate of competency, permit or variance, a certificate purporting to be signed by an Administrator stating that a person was or was not on a named day the holder of a certificate of competency, permit or variance is, without proof of the signature or official character of the person signing the certificate, prima facie proof of the facts stated in it.

1991 cS-0.5 s65

Penalty  
proceeds

**66** If a fine results from an offence under this Act with respect to a matter that an accredited municipality is authorized to administer, the fine may, on the application of the accredited municipality when the fine is assessed, accrue to the benefit of the municipality.

1991 cS-0.5 s66

## Transitional, Consequential, Repeal and Commencement Provisions

Permits, etc.,  
continue

**67(1)** On the coming into force of this Act, a permit, licence, certificate, approval, registration or order under the

- (a) *Fire Prevention Act*,
- (b) *Uniform Building Standards Act*,
- (c) *Electrical Protection Act*,
- (d) *Elevator and Fixed Conveyances Act*,
- (e) *Gas Protection Act*,
- (f) *Plumbing and Drainage Act*, or
- (g) *Boilers and Pressure Vessels Act*,

continues as a permit, certificate, registration or order under this Act until it would have expired under the Act under which it was issued or it is suspended or cancelled.

**(2)** In accordance with section 32(1)(e) of the Interpretation Act, all or any part of a code, standard or body of rules and the revisions, variations and modifications to it that have been adopted or declared in force by a regulation under an Act referred to in subsection (1) is deemed to be a regulation that has been made under this Act.

1991 cS-0.5 s67

Inspectors,  
local  
assistants

**68(1)** On the coming into force of this Act, a person who is appointed as an inspector under the

- (a) *Fire Prevention Act*,
- (b) *Uniform Building Standards Act*,
- (c) *Electrical Protection Act*,
- (d) *Elevator and Fixed Conveyances Act*,
- (e) *Gas Protection Act*,
- (f) *Plumbing and Drainage Act*,
- (g) *Boilers and Pressure Vessels Act*, or
- (h) by-laws passed pursuant to section 159(i) of the *Municipal Government Act* (RSA 1980 cM-26),

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is deemed, in accordance with the regulations, to be appointed as a safety codes officer for the period of time set out in the regulations with the powers and duties of an inspector that the person had under the previous Act.

(2) On the coming into force of this Act, a person who is designated or appointed as a local assistant under the *Fire Prevention Act* is deemed, in accordance with the regulations, to be designated or appointed as a safety codes officer under this Act for the period of time set out in the regulations with the powers and duties that the person had under the *Fire Prevention Act*.

1991 cS-0.5 s68;1994 c44 s5

Municipal  
duties

**69(1)** A local authority, as defined in the *Uniform Building Standards Act*, that is authorized to enforce that Act is deemed to be an accredited municipality under this Act with all the powers and duties it had under the *Uniform Building Standards Act*.

(2) On the coming into force of this Act, a municipality with any powers or duties under the

(a) *Fire Prevention Act*,

(b) *Electrical Protection Act*,

(c) *Elevator and Fixed Conveyances Act*,

(d) *Gas Protection Act*,

(e) *Plumbing and Drainage Act*,

(f) *Boilers and Pressure Vessels Act*, or

(g) by-laws under section 159(i) of the *Municipal Government Act* (RSA 1980 cM-26),

relating to matters regulated under this Act is deemed to be an accredited municipality with those powers and duties.

1991 cS-0.5 s69;1994 c23 s42;1994 c44 s6

**70** (NOTE: This section makes consequential amendments to other Acts. Proclaimed amendments have been incorporated in the corresponding Acts. Unproclaimed amendments will be incorporated in the remaining Acts when the corresponding subsections are proclaimed in force.)

Repeals

**71(1)** The *Fire Prevention Act* is repealed.

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(2) The *Uniform Building Standards Act* is repealed.

(3) The *Electrical Protection Act* is repealed.

(4) The *Elevator and Fixed Conveyances Act* is repealed.

(5) The *Gas Protection Act* is repealed.

(6) The *Plumbing and Drainage Act* is repealed.

(7) The *Boilers and Pressure Vessels Act* is repealed.

1991 cS-0.5 s71

(NOTE: Section 71(1) and (2) proclaimed in force March 31, 1994. Section 71(3) to (7) proclaimed in force October 1, 1994.)

Coming into  
force

**72(1)** Subject to this section, this Act comes into force on Proclamation.

(2) If this Act comes into force before section 34 of the *Liquor Control Amendment Act, 1990*, section 70(7) of this Act comes into force when section 34 of the *Liquor Control Amendment Act, 1990* comes into force.

(3) If section 34 of the *Liquor Control Amendment Act, 1990* comes into force before or at the same time as this Act, section 70(8) of this Act is repealed.

1991 cS-0.5 s72

(NOTE: Section 34 of the *Liquor Control Amendment Act, 1991* proclaimed in force July 1, 1991.)

(NOTE: Sections 1, 16, 17, 18 except clause (b), 19 and 20 proclaimed in force January 27, 1993. The remainder of the Act, except sections 2(1)(b) to (f), 67(1)(c) to (g), 68(1)(c) to (g), 69(2)(b) to (f), 70(5), (6), (9) and (10) and 71(3) to (7), proclaimed in force March 31, 1994. Sections 2(1)(b) to (f), 67(1)(c) to (g), 68(1)(c) to (g), 69(2)(b) to (f), 70(5), (6) and (10) and 71(3) to (7) proclaimed in force October 1, 1994. Section 70(9) proclaimed in force December 15, 1994.)

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