Alberta Fire Code
1992

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Alberta Fire Prevention Council
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Preface

The Alberta Fire Code

The Alberta Fire Code is essentially a set of minimum requirements respecting fire safety in existing buildings and within the community at large. Its primary purpose is the promotion of public safety through the application of uniform fire safety standards 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 Alberta Fire Code 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 a serious social and economic impact on the community as a whole.

The Alberta Fire Code contains safety measures for both the occupant of the building and the fire fighter. Safe evacuation or rescue of the occupants, as well as containment or control of a fire, are frequently achieved through requirements for property protection, however, such requirements are included, in the first instance, as life safety measures. Although increased property protection may be desirable, any additional protection for existing buildings may not be economically feasible, and the extent to which this Code can include such requirements must necessarily be based on experience and judgement.

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

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

The National Fire Code of Canada (NFC) is published by the National Research Council through the Canadian Commission on Building and Fire Codes. 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.

NFC Committees. The NFC has been developed and continues to be developed with the voluntary assistance of the many experts from coast to coast who have contributed to the work of the Canadian Commission on Building and Fire Codes. Members of the Commission are appointed by the National Research Council. They are broadly representative of all major phases of construction, fire prevention and fire protection interests in Canada; however, the members are appointed as individuals and not as designated appointees of any organization. The Commission has direct responsibility under the National Research Council for the preparation and publication of the Code.

The Commission 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. Fire and building officials, architects, engineers, contractors, building owners and others share their experience in the national interest.

IRC Staff. The Commission is assisted in its work by the staff of the Institute for Research in Construction of the National Research Council, who provide technical and administrative support. Technical problems revealed through the use of the Code are referred to the Institute for Research in Construction for study, to make available to the Commission the most up-to-date information on good fire safety practice.

Changes from the 1986 Edition. Important editorial and technical changes have been included in this edition. The ring-binder format will facilitate desktop use of the Code, as well as the inserting of revisions to the Code. The text is presented in two-column format, with bold-face headings to identify the principal subject of each article. The marginal notes that appeared in the 1986 and earlier editions of the Code have been replaced by Article headings to better assist the user in locating specific provisions. This process has resulted in the reorganization of certain requirements to ensure consistency between headings and related content.

Other editorial changes include rounding of many of the volume and quantity limits in the Code to even metric values. Many limits were originally based on convenient imperial units, such as 1 000 gallons. Since Canadian tank manufacturers now construct tanks in even metric units (1 000, 2 000 L) it is advantageous to use similar rounded values in the Fire Code. In most cases, the metric rounding has resulted in a slight relaxation of the Code requirement. A conversion table of imperial equivalents is included for the most common units and is located at the end of the document.

Technical changes have been made regarding fire safety in facilities where ordinary commodities, aerosols, dangerous goods, and flammable and combustible liquids are stored. Introduction of the term dangerous goods as a synonym for hazardous materials permits a greater integration of Fire Code requirements with Transport Canada regulations on transportation of dangerous goods. These changes have strengthened the reliance of one part of the Code upon another. For example, new requirements on storage of dangerous goods in Part 3 must be read in conjunction with certain requirements for flammable and combustible liquids in Part 4, and for specific hazardous materials in Part 5. Conversely, requirements in Parts 4 and 5 for specific dangerous goods have been modified to take advantage of general requirements now found in Part 3.

Part 1 includes some significant new definitions. In addition, the appendix note to Article 1.1.4.1., Alternatives, has been expanded to stress the need for the authority having jurisdiction to be permitted some discretion in enforcing the Code. The Fire Code requires certain life safety features in existing buildings to conform to the current Alberta Building Code, but the legislation that permits application of the Code must also permit alternatives to strict compliance. The Alberta Building Code represents the target level of safety, but the authority having jurisdiction for Fire Code enforcement should consider alternative ways to reach that target.

In Part 2, a number of articles require that life safety features, such as fire alarm, sprinkler and standpipe systems, be installed in existing buildings where required by the Alberta Building Code for new buildings. A new appendix note specifies the intended application of these requirements. A new article stresses the need to upgrade sprinkler or fire alarm systems if the fire hazard in the building changes for any reason. The provision for smoke alarms in dwelling units has been expanded. It is now required that every dwelling unit be provided with at least a battery operated alarm. Previously this requirement did not extend to buildings containing not more than two dwelling units that were constructed prior to July 1977. In recognition of the recycling programmes now in effect in many commercial buildings, in particular paper recycling in offices, the safe collection and storage of recyclable material is treated separately from that of waste material. New requirements provide for adequate receptacles at collection points in each suite and for rooms used to facilitate centralized collection. The requirements governing parking of propane fuelled vehicles in buildings have been clarified to confirm that such storage is only permitted in garages serving single family dwellings or in non-public buildings where such storage has been approved by the municipal or provincial fire authority. In response to concerns over barbecues initiating fires on balconies of buildings of residential occupancy, the use of solid fuel fired barbecues is now prohibited in buildings containing more than two dwelling units.

In Part 3, requirements for indoor storage have been completely rewritten. New Section 3.3 addresses fire safety for warehousing and general storage of ordinary commodities, rubber tires, aerosols and dangerous goods. Special fire protection measures regarding packaged aerosols are

introduced to address the hazard of uncontrolled rocketing of cans during a fire. Where dangerous goods are stored in substantial quantities, the owner will be required to install a fixed automatic fire suppression system throughout the building. This applies regardless of the intrinsic flammability of the goods stored, since the presence of toxic materials or other dangerous goods in a burning building greatly complicates fire fighting. Smoke and fire fighting water run-off can have a potentially serious impact on the surrounding community. A number of recent notable fires involving used tires stored outside without adequate consideration for proper storage procedures has resulted in new requirements where there is to be more than 300 m^3 of whole or shredded tires. New articles cover the volume of tires that can be stored in each pile, fire breaks between piles, fire department access to the site, and adequate water supplies for fire fighting.

Also in Part 3, the need for a fire safety plan for storage facilities is introduced. The fire safety plan is a source of information on maximum permitted storage heights, commodity classifications, and fire suppression system design criteria; without these, a fire prevention inspector cannot assess the level of safety in an existing facility.

Part 4 now uses the terminology of Class I, II and III flammable and combustible liquids used by the National Fire Protection Association fire codes. Use of these terms simplifies the language of the Alberta Fire Code, especially in the presentation of tables. Requirements for storage of flammable and combustible liquids in mercantile and industrial occupancies have been completely rewritten to better reflect current practices. Storage tanks for flammable and combustible liquids are permitted inside buildings, provided they are installed in special tank rooms. Where storage tanks cannot be installed in a tank room (which may be the case for certain processes incidental to the principal activity of an occupancy), minimum safety precautions are defined. In addition, use of card or key activated dispensing units at unattended self-service outlets is now permitted, provided their installation meets specific safety requirements.

A major initiative in Part 4 concerns the Management of Underground Storage Tanks (MUST) programme, which is jointly sponsored by Alberta Labour and Alberta Environment. Underground storage tanks which contain either flammable or combustible liquids, if not properly managed and maintained, can present both a serious fire and environmental hazard. While the Fire Code has dealt with these tanks in the past the focus of the programme has been greatly improved. New requirements range over the entire life of the tank, commencing with construction, registration of every new and existing tank in the province, installation and repair by approved personnel, site sensitivity classification based on ground water and subsurface sensitivity, leakage notification, phased removal of older existing tanks, and procedures for the removal or abandonment of existing tanks no longer in service.

Part 5 has been revised to specify fire safety precautions for storage of all categories of dangerous goods (hazardous materials) included in the Transportation of Dangerous Goods Regulations. These precautions assume the general indoor storage requirements in Part 3 have been applied, so that Part 5 requirements for specific dangerous goods are supplementary to Part 3 requirements. A subsection on poisonous and infectious substances (class 6 dangerous goods) has been added, and the defined terms for oxidizing substances and corrosives have been changed to conform to the terminology of the Transportation of Dangerous Goods Regulations. Improvements have been made for the storage, handling and discharge of fireworks. New provisions permit municipalities to choose whether or not to allow either their distribution and discharge, require improved record keeping for those selling fireworks and establish additional limits on their safe discharge and on the storage of both low hazard fireworks in dwelling units and the storage and display of high hazard fireworks by authorized personnel. Requirements for storage of compressed gas cylinders have also been modified.

Part 6 includes revisions to the requirements for installation and maintenance of fire alarm, sprinkler and standpipe systems. Where the 1986 Alberta Fire

Code required sprinkler systems to be installed in conformance with the Alberta Building Code, the wording has been revised to refer instead to Article 6.5.1.1., where an appendix note directs the Fire Code user to the intended reference in the Alberta Building Code. A new requirement for flow testing standpipe and hose systems from the hydraulically most remote outlet every five years has been introduced. As a number of recent fires in Canada have demonstrated, standpipe and hose systems may not function as intended during a fire emergency, due to blockages, closed valves, or incorrectly connected fire department connections. Periodic full flow testing of standpipe systems is essential to ensure that the fire department will be able to fight fires in high buildings.

Part 7. In reviewing the requirements for all of the smoke control measures it was evident that most were repetitive. Also in most high buildings there is a mix of different measures. Subsection 7.3.2. indicates the test procedures for any type of measure in any type of high building.

Appendix A has been expanded significantly, with additional explanatory material to assist users of the Code in understanding the technical requirements.

Appendix B contains the Safety Codes Act.

Change Indication. Where a technical change or addition to the 1986 edition 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.

An asterisk (*) in the margin indicates an addition or amendment to the National Fire Code at the time it was adopted in Alberta as the Alberta Fire Code 1992.

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 Alberta Building Standards 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 Alberta Fire Prevention Council and Alberta Building Standards 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 statement on the relationship between the two Codes has been included to encourage this approach.

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:

Director of Safety Standards
Alberta Labour
705, 10808 - 99 Avenue
Edmonton, Alberta, Canada
T5K 0G5

Acknowledgement

Alberta Labour, Work and Safety Division, acknowledges and thanks Mr. W.D. MacKay, Fiprotech, for his contribution during the preparation of this Code.

Relationship Between the Alberta Fire Code and the Alberta Building Code

When using the Alberta Fire Code it is important to appreciate both the special relationship which exists between it and the Alberta Building Code with respect to fire safety and the need to consider the contents of both Codes in building design, construction and maintenance. The role of each Code with respect to fire safety can be summarized as follows:

Alberta Fire Code (AFC) - establishes the standard for fire prevention, fire fighting and life safety in buildings in use,* 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 Alberta Fire Code establishes the standard for prevention, containment and fighting of fires originating outside buildings which may present a hazard to a community and sets standards for the storage and handling of dangerous goods, flammable liquids and combustible liquids.

Alberta Building Code (ABC) - establishes the standard of fire safety for the construction of new buildings, the reconstruction of buildings, including extensions or alterations, buildings involving a change of occupancy and upgrading of buildings to remove an unacceptable fire hazard.*

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. In order to ensure their effective application, it is important that fire and building officials be fully conversant with the fire safety standards of both Codes. Such officials should be involved both in the review and approval of plans with respect to fire safety prior to granting a building permit and with the inspection of buildings for fire safety purposes. This is the only way to ensure that all known hazards have been considered and that a satisfactory standard of fire safety has been achieved.

* The extent of application of the AFC and the ABC 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. An article may be broken down further into sentences, clauses and subclauses, each of which, as can be seen below, is in parentheses.

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: Application and Definitions

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 the technical requirements can be applied with a minimum of difficulty.

Part 2: Building and Occupant Fire Safety

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

Part 3: Industrial and Commercial Occupancies

This Part provides life safety and property protection requirements for specific industrial and commercial occupancies in which the use, storage and handling of hazardous materials or the stockpiling of combustible materials create a potentially serious hazard.

Part 4: Flammable and Combustible Liquids

This Part contains requirements for the storage, handling and use of flammable and combustible liquids in connection with the operation of residential, assembly, institutional, commercial and industrial facilities.

Part 5: Hazardous Materials, Processes and Operations

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

Part 6: Installation, Inspection, Testing, Maintenance and Operation of Fire Protection Equipment

This Part is designed to ensure the continued safe operation of portable extinguishers, fire suppression systems, fire alarm systems, water supplies for fire protection, emergency power installations, lightning protection and requirements for fire fighting hose.

Part 7: Inspection, Testing and Maintenance of Fire Emergency Systems in High Buildings

Part 7 is intended to complement the specific requirements for high buildings found in Part 3 of the Alberta Building Code and Chapter 3 of the Supplement to the National Building Code by establishing requirements for the inspecting, testing and maintenance of fire emergency systems in such buildings.

Appendix A: Explanatory Information

Appendix A provides explanatory information to assist the user in understanding the requirements contained in Parts 1 to 7. It is included for information purposes only and is not part of the technical requirements of the Code.

Appendix B: Safety Codes Act

This shows the legislation under which the Alberta Fire Code is adopted, gives the powers of an inspector and the appeal mechanism.

Metric Conversion Table

Part 1
Application and Definitions

Part 1
Application and Definitions

Section 1.1 Application

1.1.1. General

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

* **1.1.1.2. Alberta Fire Code.** This Code may be cited as the Alberta Fire Code 1992.

1.1.2. Equivalents

1.1.2.1. Materials, Systems and Equipment

(1) The provisions of this Code are not intended to limit the appropriate use of materials, systems and equipment 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 may be used if it can be shown that they are suitable on the basis of past performance, or on the basis of tests or evaluations that have been *approved*.

* **(3)** Where no published test method exists, any test submitted to determine equivalency shall be designed to simulate or exceed anticipated service conditions or shall be designed to compare the performance of the materials, systems or equipment with similar materials, systems or equipment that is known to be *approved*.

1.1.3. Alternate Test Standards

* **1.1.3.1. Acceptability.** The *Fire Authority* may accept the results of tests based on test standards other than as described in this regulation provided the *Fire Authority* is satisfied that such alternate test standards will provide fire protection comparable with the test standard specified in this Code.

1.1.4. Alternatives

1.1.4.1. Acceptability

*

(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 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 *accepted*.

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

(a) an *accepted* degree of life safety is provided by existing fire protection measures, or

(b) measures are taken to provide an *accepted* degree of fire safety.

(See Appendix A.)

1.1.4.2. Intervals between Inspections and Tests. Longer intervals between the inspections and tests specified in this Code may be permitted provided an *inspector* or *local assistant* is satisfied that such intervals do not reduce the reliability of the system or equipment requiring inspection or testing.

1.1.5. Records

1.1.5.1. Retention Period. Where this Code requires that records of inspections, maintenance procedures or tests be retained for examination by an *inspector* or *local assistant*, such records shall be retained on site during the interval between the inspections, maintenance procedures or tests, or for 2 years, whichever is greater.

1.1.6. Referenced Documents

1.1.6.1. Conflicting Requirements. When a conflict exists between the provisions of this Code and those of a referenced document, the provisions of this Code shall govern.

1.1.6.2. Effective Date

(1) Unless otherwise specified herein, the documents referenced in this Code shall include all amendments, revisions and supplements effective to 31 December 1991.

(2) Where reference is made to the Alberta Building Code, such reference is to the edition established under the Uniform Building Standards Act and regulations under that Act.

(3) Documents referenced in this Code shall be the editions designated in Table 1.1.6.A.

1.1.7. Numbering System

1.1.7.1. Nomenclature

(1) In the numbering system used in this Code the first number indicates the Part, the second number indicates the Section of the Part, the third number indicates the Subsection of the Section, and the fourth number indicates the Article of the Subsection.

(2) An Article in this Code may be divided into Sentences, which are indicated by numbers in parentheses, the Sentences may be divided into Clauses, which are indicated by lower case letters in parentheses, and the Clauses may be divided into Subclauses, which are indicated by roman numerals in parentheses.

(3) A reference in this Code by number to two or more Sections, Subsections, Articles, Sentences, Clauses or Subclauses shall be read as including the number first mentioned and the number last mentioned.

(4) A reference in this Code to a Sentence, Clause or Subclause shall, unless a contrary intention is given, be read as a reference to a Sentence, Clause or Subclause of the Article, Sentence or Clause, as the case may be, in which the reference is made.

Table 1.1.6.A.
Forming Part of Article 1.1.6.2.

Documents Referenced in the Alberta Fire Code 1992			
Issuing Agency	**Document Number**	**Title of Document**	**Code Reference**
ANSI	B16.5-1988	Pipe Flanges and Flanged Fittings	4.4.5.3(1)
API	5L-1991	Specification for Line Pipe	4.4.2.1.(4) 4.5.2.8.(1)
API	12B-1990	Specification for Bolted Tanks for Storage of Production Liquids	4.3.1.2.(1)
API	12D-1982	Specification for Field Welded Tanks for Storage of Production Liquids	4.3.1.2.(1)
API	12F-1988	Specification for Shop Welded Tanks for Storage of Production Liquids	4.3.1.2.(1)
API	620-1990	Design and Construction of Large, Welded, Low-Pressure Storage Tanks	4.3.1.3.(1) 4.3.3.1.(1)
API	650-1988	Welded Steel Tanks for Oil Storage	4.3.1.2.(1) 4.3.1.6. 4.3.3.1.(1)
* API	653-1991	Tank Inspection, Repair, Alteration and Reconstruction	4.3.2.6. (1)
API	1104-1988	Standard for Welding Pipelines and Related Facilities	4.4.5.2.(1)
API	RP1107-1991	Recommended Pipeline Maintenance Welding Practices	4.4.5.2.(1) 4.4.11.5.(6)
API	2000-1982	Venting Atmospheric and Low-Pressure Storage Tanks	4.3.4.1.
API	2200-1983	Repairs to Crude Oil, Liquefied Petroleum Gas and Products Pipelines	4.4.11.5.(6)
API	2201-1985	Procedures for Welding or Hot Tapping on Equipment Containing Flammables	4.4.11.5.(6)
ASME/ANSI	B31.3-1990	Chemical Plant and Petroleum Refinery Piping	4.4.2.1.(5)
ASTM	A53-90B	Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless	4.4.2.1.(4) 4.5.2.8.(1)
ASTM	A193/193M-91A	Specification for Alloy-Steel and Stainless Steel Bolting Materials for High Temperature Service	4.4.5.4.
ASTM	D56-87	Specification for Flash Point by the Tag Closed Tester	4.1.3.1.(1)
ASTM	D93-90	Specification for Flash Point by the Pensky-Martens Closed Tester	4.1.3.1.(2)
ASTM	D323-89	Test Method for Vapour Pressure of Petroleum Products (Reid Method)	1.2.1.2.
Column 1	2	3	4

Table 1.1.6.A. (Cont'd)

Issuing Agency	Document Number	Title of Document	Code Reference
ASTM	D3278-89	Test Methods for Flash Point of Liquids by Setaflash Closed-Cup Apparatus	4.1.3.1.(4)
ASTM	D3828-87	Test Method for Flash Point by Setaflash Closed Tester	4.1.3.1.(3)
CGSB	CAN/CGSB-4.162-M80	Hospital Textiles - Flammability Performance Requirements	2.3.2.3.
CGSB	20-GP-12Ma 1989	Braided Water Hose, Knitted or Spiral Wound Reinforcement	6.2.3.4.(1)
* CPPI	1st Edition, 1990	Recommended Practice for Product Identification at Service Stations and Distribution Terminals	4.3.11.3.(5)
CSA	CAN/CSA-B72-M87	Installation Code For Lightning Protection Systems	6.1.1.6.(1) 6.10.1.2.
CSA	CAN/CSA-B139-M91	Installation Code for Oil Burning Equipment	4.1.1.1.(3) 4.3.12.2
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),(2)
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.(2) 4.11.3.4.(1)
CSA	CAN/CSA-C282-M89	Emergency Electrical Power Supply for Buildings	6.7.1.1. 6.7.1.4.
CSA	CAN/CSA-W117.2-M87	Safety in Welding, Cutting and Allied Processes	5.16.1.1.
* CSA	CAN/CSA-Z32.4-M86	Essential Electrical Systems for Hospitals	6.7.1.1. 6.7.1.4.
CSA	CAN/CSA-Z245.1-M90	Steel Line Pipe	4.4.2.1.(4) 4.5.2.8.(1)
TC (Formerly CTC)	General Order No. 0-32	Flammable Liquids Bulk Storage Regulations	4.3.2.1.(3) 4.4.7.4.(4) 4.6.6.1.(1)
TC	General Order No. E-10	Pipe Crossings under Railways (No.-E10) Regulations	4.4.7.4.(3)
TC	1982-8 RAIL	Railway Prevention of Electric Sparks Regulations	4.6.6.5.(2)
Column 1	2	3	4

Table 1.1.6.A. (Cont'd)

Issuing Agency	Document Number	Title of Document	Code Reference
NFPA	10-1988	Portable Fire Extinguishers	3.3.4.5. 6.2.1.1.(2) 6.2.3.3.(1) 6.2.3.4.(1) Table 6.2.3.A. 6.2.4.1.(2)
NFPA	11-1988	Low Expansion Foam and Combined Agent Systems	6.8.1.2.(1)
NFPA	11A-1988	Medium and High Expansion Foam Systems	6.8.1.2.(1)
NFPA	12-1989	Carbon Dioxide Extinguishing Systems	6.8.1.2.(1)
NFPA	12A-1989	Halon 1301 Fire Extinguishing Systems	6.8.1.2.(1)
NFPA	12B-1990	Halon 1211 Fire Extinguishing Systems	6.8.1.2.(1)
NFPA	13-1989	Installation of Sprinkler Systems	3.3.3.3.(2)
* NFPA	13A-1987	Inspection, Testing and Maintenance of Sprinkler Systems	6.5.3.1.(1)
NFPA	14-1990	Installation of Standpipe and Hose Systems	6.4.1.1.(1)
NFPA	15-1990	Water Spray Fixed Systems for Fire Protection	6.8.1.2.(1)
NFPA	16-1991	Deluge Foam-Water Sprinkler Systems and Foam-Water Spray Systems	6.8.1.2.(1)
NFPA	17-1990	Dry Chemical Extinguishing Systems	6.8.1.2.(1)
* NFPA	17A-1990	Wet Chemical Extinguishing Systems	6.8.1.2.(1)
NFPA	18-1990	Wetting Agents	6.8.1.2.(1)
* NFPA	20-1990	Installation of Centrifugal Pumps	6.6.3.3.(6)
NFPA	32-1990	Drycleaning Plants	3.6.1.1.
* NFPA	33-1989	Spray Application Using Flammable and Combustible Materials	5.14.1.1.(1)
* NFPA	34-1989	Dipping and Coating Processes Using Flammable or Combustible Liquids	5.14.1.1.(1)
NFPA	35-1987	Manufacture of Organic Coatings	5.4.2.1.(1)
NFPA	37-1990	Installation and Use of Stationary Combustion Engines and Gas Turbines	4.3.12.3.(1)
NFPA	40-1988	Storage and Handling of Cellulose Nitrate Motion Picture Film	5.4.6.1.(1)
NFPA	40E-1986	Storage of Pyroxylin Plastic	5.4.4.3.
Column 1	2	3	4

Table 1.1.6.A. (Cont'd)

Issuing Agency	Document Number	Title of Document	Code Reference
NFPA	51-1987	Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting and Allied Processes	5.16.2.1.
NFPA	72D-1986	Installation, Maintenance and Use of Proprietary Protective Signalling Systems	6.3.1.4.
* NFPA	80A-1987	Protection of Buildings From Exterior Fire Exposures	3.5.3.3.(2)
NFPA	82-1990	Incinerators, Waste and Linen Handling Systems and Equipment	2.6.2.2.
NFPA	91-1990	Installation of Blower and Exhaust Systems for Dust, Stock and Vapour Removal or Conveying	3.2.1.2. 3.3.2.3.(6)
NFPA	96-1987	Installation of Equipment for the Removal of Smoke and Grease-Laden Vapours from Commercial Cooking Equipment	2.6.1.9.(1),(2)
* NFPA	101®-1991	Life Safety Code®	2.18.1.2.(4)
NFPA	231-1990	General Storage	3.3.2.1.(1) 3.3.2.4.(3) 3.3.3.3.(2),(3)
NFPA	231C-1991	Rack Storage of Materials	3.3.3.3.(2),(3)
NFPA	231D-1989	Storage of Rubber Tires	3.3.4.3.(1)
NFPA	505-1987	Fire Safety Standard for Powered Industrial Trucks	3.4.1.1.(1)
NFPA	701-1989	Standard Methods of Fire Tests for Flame-Resistant Textiles and Films	2.3.2.2.(1) 2.9.2.1.
* NFPA	1231-1989	Water Supplies for Suburban and Rural Firefighting	3.5.3.11.(1)
* NFPA	1962-1988	Care, Use and Service Testing of Fire Hose Including Connections and Nozzles	6.4.1.1.(4)
* PACE (now CPPI)	Report No. 87-1	Impressed Current Method of Cathodic Protection of Underground Storage Tanks	4.5.12.2.(1)
ULC	C30-1974	Guide for the Investigation of Metal Safety Containers	4.2.3.1.(1)
* ULC	ULC/ORD-C58.15-1991	Overfill Protection Devices for Underground Flammable Liquid Storage Tanks	4.3.8.1.(4)
* ULC	ULC/ORD-C58.19-1991	Spill Containment Devices for Underground Flammable Liquid Storage Tanks	4.3.8.1.(4)
ULC	C107C-M1984	Guide for Glass Fibre Reinforced Plastic Pipe and Fittings for Flammable Liquids	4.4.2.1.(3) 4.5.2.8.(2)
Column 1	2	3	4

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Table 1.1.6.A. (Cont'd)

Issuing Agency	Document Number	Title of Document	Code Reference
ULC	C142.13-M1988	Guide for Steel Tanks Mounted on Service Truck Platforms for Transportation of Flammable and Combustible Liquids	4.11.3.4.(2)
ULC	C558-1975	Guide for the Investigation of Internal Combustion Engine-Powered Industrial Trucks	3.4.1.1.(2)
ULC	C583-1974	Guide for the Investigation of Electric Battery Powered Industrial Trucks	3.4.1.1.(3)
ULC	C842-M1984	Guide for the Investigation of Valves for Flammable and Combustible Liquids	4.4.8.1.(1)
ULC	CAN/ULC-S101-M89	Standard Methods of Fire Endurance Tests of Building Construction and Materials	4.2.10.5(1)
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	CAN4-S507-M83	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	6.2.2.2.
ULC	CAN/ULC-S512-M87	Halogenated Agent Hand and Wheeled Fire Extinguishers	6.2.1.2.(1)
* ULC	ULC-S513-1978	Threaded Couplings for 1 1/2 and 2 1/2 Inch Fire Hose	6.9.1.1.(3)
* ULC	CAN/ULC-S524-M86	Standard for Installation of Fire Alarm Systems	6.3.1.7.
ULC	CAN/ULC-S531-M87	Standard for Smoke Alarms	2.1.3.3.(1)
ULC	CAN/ULC-S536-M86	Standard for Inspection and Testing of Fire Alarm Systems	6.3.1.2.(1),(2) 6.3.1.7.
* ULC	CAN/ULC-S537-M86	Standard for Verification of Fire Alarm System Installations	6.3.1.7.
* ULC	CAN4-S543-M84	Standard for Internal Lug, Quick Connect Couplings for Fire Hose	6.9.1.1.(4)
ULC	CAN4-S601-M84	Standard for Shop Fabricated Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids	4.3.1.2.(1)
* ULC	CAN4-S601(A)-89	Refurbishing of Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids	4.3.2.6.(1)
Column 1	2	3	4

Table 1.1.6.A. (Cont'd)

Issuing Agency	Document Number	Title of Document	Code Reference
ULC	CAN4-S603-M85	Standard for Steel Underground Tanks for Flammable and Combustible Liquids	4.3.1.2.(1) 4.3.16.4.(5)
ULC	CAN4-S603.1-M85	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),(2) 4.5.2.9.(1) 4.5.12.2.(1)
ULC	CAN4-S603(A)-87	Refurbishing of Steel Underground Tanks for Flammable and Combustible Liquids	4.10.4.2.(2)
ULC	CAN/ULC-S612-M88	Hose for Flammable and Combustible Liquids	4.5.5.1.(1)
ULC	CAN4-S615-M83	Standard for Reinforced Plastic Underground Tanks for Petroleum Products	4.3.1.2.(1) 4.3.8.5.(2) 4.3.16.4.(5)
* ULC	CAN4-S615(A)-87	Refurbishing of Reinforced Plastic Underground Tanks for Petroleum Fuels	4.10.4.2.(2)
ULC	CAN/ULC-S620-M90	Standard for Hose Nozzle Valves for Flammable and Combustible Liquids	4.1.8.3.(1) 4.4.8.1.(2) 4.5.5.2.(1),(2)
ULC	CAN4-S630-M84	Standard for Shop Fabricated Steel Aboveground Vertical Tanks for Flammable and Combustible Liquids	4.3.1.2.(1) 4.3.3.2.
* ULC	CAN4-S630(A)-89	Refurbishing of Steel Aboveground Vertical Tanks for Flammable and Combustible Liquids	4.3.2.6.(1)
ULC	CAN/ULC-S633-M90	Standard for Flexible Underground Hose Connectors for Flammable and Combustible Liquids	4.4.7.13.(2)
ULC	CAN/ULC-S642-M87	Standard for Compounds and Tapes for Threaded Pipe Joints	4.4.5.1.
ULC	CAN/ULC-S643-M90	Standard for Shop Fabricated Steel Aboveground Utility Tanks for Flammable and Combustible Liquids	4.3.1.2.(1)
ULC	CAN/ULC-S651-M90	Standard for Emergency Valves for Flammable and Combustible Liquids	4.4.8.1.(3) 4.5.6.3.(1)
Column 1	2	3	4

Section 1.2 Definitions

1.2.1. Terms

* **1.2.1.1. Non-Defined Words and Phrases.** Words and phrases that are not included in the list of definitions in Article 1.2.1.3. 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. Referenced Dictionary.** For definitions of words that are not defined in the Fire Prevention Act or in Article 1.2.1.3. reference should be made to Webster's Third New International Dictionary.

1.2.1.3. Defined Words and Phrases. The words and terms used in this Code that are in italics have the following meanings

* *Accepted* means acceptable to
(a) the Fire Chief, in a municipality that has a fire chief, or
(b) an *inspector*, in a municipality that does not have a Fire Chief.

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 Fire Prevention 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 electrical energy or fuel into thermal 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 Senior Technical Officer, Fire Standards.

Assembly occupancy 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).

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

Boiler means an *appliance* intended to supply hot water or steam for space heating, processing or power purposes.

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.*

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

Business and personal services occupancy 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.

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.

Chimney liner means a conduit containing a *chimney flue* used as a lining of a masonry or concrete *chimney.*

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 temperatures in which it would normally be stored.

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 explode, including those resulting from the handling or processing of grain, malt and the manufacturing of flour and feed.

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 any liquid having a *flash point* at or above 37.8°C and below 93.3°C.

Compressed gas means any contained mixture or material with either an absolute pressure exceeding 275 kPa at 21°C or any absolute pressure exceeding 717 kPa at 54°C or both, or any liquid having an absolute *vapour pressure* exceeding 275 kPa at 38°C.

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 3.3.6.A.)

Distilled beverage alcohol means a beverage that is produced by fermentation and contains more than 20 per cent 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.

Drum means a container having a capacity of less than 249 L but more than 30 L. (See Sentence 4.2.3.1.(1).)

Dwelling unit means a room or *suite* of rooms 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 Authority means the Fire Commissioner or a person authorized by him in writing to act on his behalf.

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

Fire Chief means the person designated by a municipality as head of the Municipal Fire Department in accordance with the Municipal Government Act or the County Act.

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 normally held open damper installed in an air distribution system or a wall or floor assembly, and 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 specific conditions of test and performance criteria, or as otherwise prescribed in this 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 this 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 Regulations (Canada).

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 any 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.

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* and *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*.

Furnace means a *space-heating appliance* using warm air as the heating medium and usually having provision for the attachment of ducts.

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

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 means the *occupancy* or use of a *building* or part thereof for assembling, fabricating, manufacturing, processing, repairing or storing of goods and materials. (See also High hazard industrial occupancy, Medium hazard industrial occupancy, and Low hazard industrial occupancy.)

Inspector means a person appointed as an inspector pursuant to Section 2 of the *Act* and includes the Fire Commissioner, Deputy Fire Commissioner, and the Senior Technical Officer, Fire Standards. *

Institutional occupancy means the *occupancy* or use of a *building* or part thereof by persons who require special care or treatment because of mental or physical limitations or by persons who are under restraint for correctional purposes and are incapable of self preservation because of security measures not under their control.

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*.

* *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 supply of a 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.

* *Local assistant* means a person appointed as a local assistant pursuant to Section 4 of the *Act*.

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.

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

Low hazard industrial occupancy (Group F, Division 3) means an *industrial occupancy* in which the combustible content is not more than 50 kg/m^2 or 1200 MJ/m^2 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).

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 service station means a *service station* at which *flammable liquids* or *combustible liquids* are put into the fuel tanks of vehicles, 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^2 or 1200 MJ/m^2 of *floor area* and which is not classified as *high hazard industrial occupancy*.

Mercantile occupancy 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 number of persons for which a *building* or part thereof is designed.

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 means a person who *

  (a) controls the property under consideration,

  (b) holds himself out as the person having the powers and authority of ownership or

who for the time being excercises the powers and authority of ownership,

(c) is registered under provincial legislation as the owner of a freehold estate in possession of land, or

(d) has purchased or otherwise acquired land, whether he has purchased or otherwise acquired the land directly from a previous owner or from another purchaser, and has not yet registered his 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 load-bearing.

Portable container means a reusable container that has a capacity of 30 L or less, but excludes a container which is integral with or permanently attached to any *appliance*, equipment or vehicle. (See Sentence 4.2.3.1.(1).)

Portable tank means a *closed container* that is designed to be movable while containing liquid, which is equipped with skids, mountings or accessories to facilitate handling of the tank by mechanical means, and is not permanently attached to a transporting vehicle.

Prepackaged container means a container not intended for reuse. (See Sentence 4.2.3.1.(1).)

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 *compressed gases*, are produced or used in a process.

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 site.

Residential occupancy 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 who are not involuntarily detained.

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. *

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.

Service station means any premises at which *flammable liquids* or *combustible liquids* are put into the fuel tanks of vehicles, watercraft, or aircraft. *

Self-service outlet means a *service station* other than a *marine service station* where the public operates the dispensing apparatus. *

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. *

Space heater means a *space-heating appliance* for heating the room or space within which it is located without the use of ducts.

Space-heating appliance means an *appliance* intended for the supplying of heat to a room or space directly, such as a *space heater*, fireplace or unit heater, or to rooms or spaces of a *building* through a heating system such as a central *furnace* or *boiler*.

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 are 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 *closed container* of not less than 250 L capacity used for the storage of *flammable liquids* or *combustible liquids*.

Storage tank system means a system of storing and dispensing *flammable liquids* or *combustible liquids* and includes, but 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 *assembly, business and personal services*, and *medium* and *low hazard industrial 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 and may also refer to the local fire department where it assumes these responsibilities.

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

Tent means a shelter or structure the covering of which is made of pliable material.

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.

Used oil means a petroleum oil no longer intended to be used for lubricating motor vehicle engines and similar uses.

Vapour pressure means the pressure exerted by a liquid as determined by ASTM D323, "Test Method for Vapour Pressure of Petroleum Products (Reid Method)."

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.

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.

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

API.....American Petroleum Institute (1220 L Street N.W., Washington, D.C., 20005 U.S.A.)

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

CAN.....National Standard of Canada designation (The number following the CAN designation represents the agency under whose auspices the standard was issued. CAN1 designates CGA, CAN2 designates CGSB, CAN3 designates CSA and CAN4 designates ULC.)

CCBFC.....Canadian Commission on Building and Fire Codes (National Research Council of Canada, Ottawa, Ontario, K1A 0R6)

CGA.....Canadian Gas Association (55 Scarsdale Road, Don Mills, Ontario, M3B 2R3)

CGSB.....Canadian General Standards Board (Ottawa, Ontario, K1A 1G6)

* CPPI.....Canadian Petroleum Products Institute (Suite 1000, 275 Slater Street, Ottawa, Ontario, K1P 5H9)

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

NFPA.....National Fire Protection Association (Batterymarch Park, Quincy, Massachusetts, 02269 U.S.A.)

* PACE.....Petroleum Association for Conservation of the Canadian Environment (now Canadian Petroleum Products Institute - see CPPI)

TC.....Transport Canada (formerly CTC) (Rail Safety Directorate, 344 Slater Street, 15th Floor, Ottawa, Ontario, K1A 0N5)

TDGR.....Transportation of Dangerous Goods Regulations (Transport Dangerous Goods Directorate, Transport Canada, 344 Slater Street, Ottawa, Ontario, K1A 0N5)

ULC.....Underwriter's Laboratories of Canada (7 Crouse Road, Scarborough, Ontario, M1R 3A9)

U.S.DOT.....United States Department of Transportation (400 - 7 Street S.W., Washington, D.C., 20590 U.S.A.)

WHMIS.....Workplace Hazardous Materials Information System (Product Safety Branch, Consumer and Corporate Affairs Canada, Place du Portage, Phase I, Hull, Quebec, K1A 0C9) OR Alberta Occupational Health and Safety (1709 Jasper Avenue, Edmonton, Alberta, T5J 3N3) *

1.2.2.2. Symbols and Other Abbreviations.

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

cm.....centimetre(s)

°C.....degree(s) Celsius

diam.....diameter

div.....division

h.....hour(s)

kg.....kilogram(s)

kN.....kilonewton(s)

kPa.....kilopascal(s)

L.....litre(s)

m.....metre(s)

min.....minute(s)

MJ.....megajoule(s) *

mL.....millilitre(s) *

mm.....millimetre(s)

mm^2/s.....centistokes

N.....newton(s)

ppm.....parts per million

rpm.....revolutions per minute

s.....second(s)

t.....tonne(s)

V.....volt(s)

≤.....less than or equal to

xx^2.....squared unit *

xx^3.....cubic unit *

/.....per *

Part 2
Building and Occupant Fire Safety

Part 2
Building and Occupant Fire Safety

Section 2.1 General

2.1.1. Application

2.1.1.1. Application. Part 2 of this Code 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* and the establishing of a fire safety plan in those *occupancies* where it is considered necessary.

2.1.2. Classification of Buildings

(See Appendix A.)

* **2.1.2.1. Classification.** For the purpose of applying this Code, every *building* or part thereof shall be classified by an *inspector* or *local assistant* according to its *major occupancy* in conformance with the Alberta Building Code.

2.1.2.2. Hazardous Activities

* **(1)** Activities which, in the opinion of the *fire authority*, 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 *fire authority* 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 Group A, B or C.

2.1.3. Fire Safety Installations

2.1.3.1. Fire Alarm, Standpipe and Sprinkler Systems

* **(1)** Except as provided in Article 1.1.4.1., fire protection systems, including fire alarms, standpipes and sprinklers shall be installed in *buildings* in conformance with the requirements of the Alberta Building Code, and the Electrical Protection Act and regulations under that 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.

2.1.3.2. Voice Communication Systems. * Except as provided in Article 1.1.4.1., a *listed* and *labelled* voice communication system or systems integrated with the general fire alarm system shall be provided in *buildings* in conformance with Subsection 3.2.6. of the Alberta Building Code, and the Electrical Protection Act and regulations under that Act.

2.1.3.3. Smoke Alarms

(1) *Smoke alarms* conforming to CAN/ULC-S531, "Standard for Smoke Alarms," shall be installed in each *dwelling unit* and, except for an *institutional occupancy* 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 corridors, the *smoke alarms* shall be installed in the corridors. *

(3) *Smoke alarms* shall be installed, inspected, tested and maintained in conformance with the manufacturer's instructions.

(4) Except as required by the Alberta Building Code *smoke alarms* may be battery operated. *

(5) If a *smoke alarm* or a *smoke detector* or a smoke detection system was installed in a *building* or *

part of a *building* before the effective date of this Code, an *inspector* or *local assistant* may permit the *smoke alarm, smoke detector* or smoke detection system to remain in operation.

Section 2.2 Fire Separations

2.2.1. General

2.2.1.1. Fire Separations

* **(1)** Except as provided in Article 1.1.4.1., 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 the requirements elsewhere in this Code and the Alberta Building Code.

* **(3)** Except as provided in Article 1.1.4.1., rooms, corridors, shafts and other spaces shall be separated where practicable by *fire separations* in conformance with requirements of the Alberta Building Code.

* **2.2.1.2. Damage to Fire Separations.** 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 requirements of the Alberta Building Code.

2.2.2. Closures

2.2.2.1. Openings in Fire Separations

* **(1)** Except as provided in Article 1.1.4.1., 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. 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. Protective guarding devices shall be provided where necessary to prevent damage to the mechanical components of the doors in *fire separations* and shall be 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 in operable condition at all times including, but not limited to

(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 daily to ensure that they remain closed unless the door is equipped with an *accepted* hold-open device that will permit the door to close automatically in the event of a fire.

(3) Doors in *fire separations* shall be operated * at least monthly.

(4) *Closures* in *fire separations* shall not be blocked or wedged open.

(5) *Fire dampers* and *fire stop flaps* shall be *
(a) visually inspected annually,
(b) maintained and repaired whenever obstructed or damaged, and
(c) inspected whenever a fire alarm and detection system or smoke zone test is conducted in *buildings* within the scope of Subsection 3.2.6. of the Alberta Building Code.

Section 2.3 Interior Finishing, Furnishing and Decorative Materials

2.3.1. General

* **2.3.1.1. Interior Finish.** Except as provided in Article 1.1.4.1., the interior finish material that forms part of the interior surface of a floor, wall, *partition* or ceiling shall be in conformance with the Alberta Building Code.

* **2.3.1.2. Movable Partitions and Screens.** No person shall install movable *partitions* or screens, including acoustical screens, that have a *flame-spread rating* greater than that required for the interior finish of the area in which they are located.

* **2.3.1.3. Festive Decoration.** Material used for festive decorations in a Group A or Group B *occupancy*, including but not limited to crepe paper decorations, other combustible trimming or ornaments and Christmas trees, shall be of the flame resistant type. (See Appendix A.)

* **2.3.1.4. Interconnected Floor Spaces.** 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.** 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 *accepted* precautions have been taken to protect the occupants from the hazards of fire. (See Appendix A, A-2.1.2.2.(1))

2.3.2. Flame Resistance

* **2.3.2.1. Drapes, Curtains and Decorative Materials.** Drapes, curtains and other decorative materials used in *buildings* shall be in conformance with the Alberta Building Code.

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, "Standard Methods of 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* for a minimum of 2 years. *

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

Section 2.4 Fire Hazards

2.4.1. Combustible Materials

2.4.1.1. Accumulation of Combustible Materials

(1) No person shall allow combustible materials to be stored in and around *buildings* or to accumulate in quantities or locations that will constitute an undue fire hazard. (See Appendix A.) *

(2) No person shall allow combustible materials, other than those for which the location, room or space is designed, to accumulate in any part of an elevator shaft, ventilation shaft, *means of egress*, *service room* or *service space*. (See Appendix A.) *

(3) No person shall store combustible materials in horizontal concealed spaces, such as crawl and ceiling spaces. *

(4) No person shall store combustible materials on a roof or adjacent to any *building* so as to create a fire hazard to the *building* or its occupants. *

2.4.1.2. Storage Rooms for Combustible Materials. Except as provided in Article 1.1.4.1., where rooms are provided for the storage of combustible materials, such rooms shall be in conformance with the Alberta Building Code. *

2.4.1.3. Absorbent Materials *

(1) No person shall use a material to absorb *flammable liquid* or *combustible liquid* spills within *buildings* unless the material is

(a) non-combustible, and

(b) disposed of in an *accepted* manner.

2.4.1.4. Use of Receptacles

* **(1)** No person shall store or deposit grease or oil laden rags or materials subject to spontaneous heating in a *building* unless they are located in a receptacle conforming to Article 2.4.1.5.

* **(2)** No person shall store or deposit ashes in receptacles unless the receptacle conforms to Article 2.4.1.5.

* **(3)** No person shall store ashes in the same receptacle with other combustible materials.

* **(4)** Except as permitted in Article 2.4.1.5., no person shall place receptacles as required in Sentences (1) and (2) closer than 1 m from combustible materials.

* 2.4.1.5. Waste Receptacles

(1) Waste receptacles having a capacity greater than 0.03 m^3 used within a *building* shall be constructed in accordance with Sentence (2).

(2) A receptacle required in Article 2.4.1.4. and Sentence (1) shall

(a) be constructed of noncombustible material and have a close-fitting cover which shall be permanently chained or hinged to the receptacle, and

(b) have a flanged bottom or legs not less than 50 mm high, if the flooring material upon which it is placed is combustible, or

(c) be *listed* and *labelled*.

(3) Unless *accepted*, receptacles used for combustible materials and stored outside *buildings* shall be located at least 3 m from combustible *buildings* and the cover shall remain closed when the receptacle is not being filled or emptied. (See Appendix A.)

* 2.4.1.6. Receptacles For Combustible Recyclable Material

(1) Receptacles for combustible recyclable material having a capacity greater than 0.125 m^3 used within a *building* shall be

(a) constructed of noncombustible materials, and

(b) be fully enclosed and have a tight fitting lid, or

(c) be located in a storage room conforming to Article 2.4.1.7.

(2) Unless *accepted* only one receptacle for combustible recyclable materials per *suite* shall be permitted.

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

(4) Receptacles for combustible recyclable material shall not be placed in lunch rooms, staff rooms or washrooms. (See Appendix A).

2.4.1.7. Storage Rooms for Combustible Recyclable Materials. * 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.

2.4.1.8. Lint Traps for Laundry Equipment. * 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) If, in the opinion of an *inspector* or *local assistant*, conditions in a *building* are such that smoking is a fire or explosion hazard, the *inspector* or *local assistant* may designate smoking and non-smoking areas. *

(2) No person shall smoke in a non-smoking area. *

(3) No person shall deposit smoking materials including, but not limited to cigarettes, cigars, matches or ashes, into receptacles for combustible recyclable material. *

2.4.2.2. Signs

(1) Non-smoking areas in Article 2.4.2.1., or as referred to elsewhere in this Code, shall be identified by *

(a) a sign in black or red lettering not less than 50 mm high with 12 mm stroke on a yellow or white background, respectively, or

(b) international non-smoking symbols not less than 150 mm by 150 mm.

* **(2)** Sentence (1) does not apply to *accepted* signs installed prior to the coming into force of this Code.

2.4.3. Open Flames

* **2.4.3.1. Open Flames in Processions.** Unless *accepted*, no person shall use an open flame in processions, at displays, or as part of an act or other entertainment in an assembly area or *building* used for public assembly.

2.4.3.2. Flaming Meals and Drinks

* **(1)** No person shall serve flaming meals or drinks in Group B, Division 2 occupancies.

(2) In places of public assembly, flaming meals or drinks shall be ignited only at the location of serving.

(3) Refuelling of *appliances* and containers used for flaming meals or drinks or for warming food shall be carried out only in an *accepted* area.

2.4.3.3. Portable Extinguishers. A portable extinguisher with a minimum rating of 5-BC shall be located on the serving cart or table where flaming meals or drinks are being served.

2.4.3.4. Devices Having Open Flames. 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 Hazardous Materials

* **2.4.4.1. Flammable Liquids.** No person shall use *flammable liquids* for cleaning purposes except where such cleaning is an essential part of a process and the *flammable liquids* are stored and handled in conformance with Part 4.

* **2.4.4.2. Flammable Gases.** Unless *accepted*, no person shall use flammable gases to inflate balloons.

* **2.4.4.3. Internal Combustion Powered Equipment.** Unless *accepted*, equipment utilizing an internal combustion engine shall be stored in a *storage garage*.

2.4.4.4. Emergency Shutoff Valves in Schools. * 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), no person shall park a propane fuelled vehicle in

(a) an underground parking facility, or

(b) an enclosed structure.

(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 has been *accepted*.

(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 Gas Protection Act and regulations under that Act.

2.4.4.6. Gas Containers. * No person shall store or use a natural gas or liquified petroleum gas container for use with fuel burning *appliances* or equipment except in conformance with the Gas Protection Act and regulations under that Act.

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. Vacant Buildings

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

Section 2.5 Fire Department Access to Buildings

2.5.1. General

* **2.5.1.1. Street Access.** Except as provided in Article 1.1.4.1., fire department vehicles shall have direct access to at least one face of every *building* by means of a *street*, yard or private roadway in conformance with the requirements of the Alberta Building Code.

* **2.5.1.2. Access Panels and Windows.** Access panels or windows provided to facilitate access for fire fighting operations shall not be obstructed on the exterior or interior, by vehicles, vegetation, signs or any form of construction.

2.5.1.3. Access to Roof. Where access to a roof is provided for fire fighting purposes, keys shall be provided for locked roof access doors in an *accepted* location accessible to the fire fighters.

2.5.1.4. Access to Fire Department Connections. 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 private roadways provided for fire department access shall be maintained so as to be ready for use at all times by fire department vehicles.

* **(2)** Signs identifying access routes and prohibiting parking of vehicles therein, shall be posted in *accepted* locations. (See Appendix A.)

Section 2.6 Service Equipment

2.6.1. Heating, Ventilating and Air-Conditioning

* **2.6.1.1. Installation.** Except as provided in Article 1.1.4.1., heating, ventilating and air-conditioning *appliances* and equipment, including fireplaces and stoves, shall be installed in conformance with the Alberta Building Code and the Electrical Protection Act and regulations under that Act.

2.6.1.2. Coal and Wood Bins. Coal and wood bins shall be located a minimum of 1.2 m from the *appliance* served. *

2.6.1.3. Hoods, Ducts and Filters. Hoods, ducts and filters subject to accumulations of combustible deposits shall be inspected at least weekly, and shall be cleaned if the accumulation of such deposits are sufficient to create a fire hazard. *

2.6.1.4. Chimneys, Flues and Flue Pipes

(1) Every *chimney*, *flue* and *flue pipe* shall be inspected

(a) annually,
(b) when an *appliance* is added or replaced, or
(c) after any *chimney* fire.

(See Appendix A.)

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

(3) *Chimney*, *flue* or *flue pipe* shall be replaced or repaired to eliminate

(a) any structural deficiency, such as absence of a liner, or decay such as cracking, settling, crumbling mortar, distortion, advanced corrosion, separation of sections, or loose or broken supports, and
(b) 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 least yearly to establish that the system can be shutdown 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 an *inspector* or *local assistant* in conformance with Article 1.1.5.1.

2.6.1.7. Ventilation Shafts. 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 shutdown, the duct 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 1.1.4.1., of this Code and Sentence 3.5.3.1.(1) and Article 3.5.4.2. of the Alberta Building Code, commercial cooking equipment exhaust and fire protection systems shall be installed and maintained in conformance with NFPA 96, "Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment."

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

2.6.2. Incinerators

* **2.6.2.1. Indoor Incinerators.** Except as provided in Article 1.1.4.1., the installation and alteration of indoor incinerators shall conform to the requirements of the Alberta Building Code.

2.6.2.2. Outdoor Incinerators. 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 least yearly or more frequently where accumulations of debris will adversely affect operations.

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

2.6.3. Electrical Equipment Vaults

2.6.3.1. Use. Electrical equipment vaults shall not be used for storage purposes.

2.6.3.2. Security. Electrical equipment vaults * shall be kept locked.

Section 2.7 Safety to Life

2.7.1. Means of Egress

2.7.1.1. Means of Egress. Except as provided * in Article 1.1.4.1., *means of egress* shall be provided in *buildings* in conformance with the Alberta Building Code.

2.7.1.2. Business and Personal Services Occupancies

(1) All individual work areas in Group D *occupancies* shall be located adjacent to aisles described in Sentences (2) and (3).

(2) In *buildings* of Group D *occupancy* where 2 * *exits* are required from *floor areas* which are not subdivided into rooms or *suites* served by corridors giving *access to exits*, at least one aisle with access to the 2 *exits* having a minimum clear width of 1 100 mm shall be provided, where necessary, to serve the individual work areas.

(3) Subsidiary aisles with a minimum clear width of 900 mm may branch off for a distance not exceeding 7.5 m from the aisles described in Sentence (2).

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

(a) the number of occupants determined in accordance with Table 3.1.16.A of the Alberta Building Code, or

(b) the *occupant load* for which *means of egress* are provided.
(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 (2) is made available when requested by an *inspector* or *local assistant*.

2.7.1.4. Signage

(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 *approved*.

2.7.1.5. Nonfixed Row Seating. Nonfixed row seating provided in places of public assembly shall conform to the spacing requirements for fixed seating in conformance with the Alberta Building Code.

2.7.1.6. Maintenance

(1) *Exit* doors and *exit* door hardware shall be maintained in good repair.

(2) Every *means of egress* shall be kept 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 as specified in 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.

(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

(a) read "Fire Exit. No parking within 3 m",

(b) have red lettering on a contrasting background, and

(c) have letters 100 mm high with a 15 mm stroke.

2.7.2. Door Release Hardware

2.7.2.1. Door Release Hardware

(1) Except as provided in Article 1.1.4.1., 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) Where a latching or locking device is installed on a door that utilizes an unusual or com-

plicated operating mechanism, an *inspector* or *local assistant* may require that the *owner* post an *accepted* sign at the door that provides information about the operation of the device.

2.7.3. Exit Lighting, Exit Signs and Emergency Lighting

2.7.3.1. Installation and Maintenance

* **(1)** Except as provided in Article 1.1.4.1., *exit* lighting, *exit* signs and emergency lighting shall be provided in *buildings* in conformance with the Alberta Building Code and the Electrical Protection Act and regulations under that Act. (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 safety procedures conforming to this Section shall be provided for

(a) every *building* containing a Group A or B *occupancy*,

(b) every *building* required by the Alberta Building Code to have a fire alarm system,

(c) demolition and construction sites regulated under Sections 2.14 and 2.15 of this Code,

(d) storage areas required to have a fire safety plan in conformance with Article 3.3.2.6.,

(e) areas where *flammable liquids* or *combustible liquids* are stored or handled, in conformance with Article 4.1.5.7., and

(f) areas where hazardous materials are present, or where hazardous processes or operations occur, in conformance with Article 5.1.6.1.

2.8.1.2. Instruction of Supervisory Staff. *Supervisory staff* shall be instructed in the fire emergency procedures as 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. Any keys or special devices needed to operate the alarm system or provide access to any fire protection systems or equipment shall be readily available to on-duty *supervisory staff*.

2.8.1.4. Fire Fighting Procedures for High Buildings. * Fire fighting procedures shall be prepared by the *Fire Chief* 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. Fire Safety Plan

2.8.2.1. Measures in a Fire Safety Plan

(1) Except where a written exemption has * been issued by the *fire authority*, *buildings* or parts thereof described in Article 2.8.1.1. shall have an *accepted* fire safety plan. (See Appendix A.)

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

(a) 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 endangered occupants, including special provisions for the disabled (see Appendix A), and

(v) confining, controlling and extinguishing the fire,

(b) appointment and organization of designated *supervisory staff* to carry out fire safety duties,

(c) instruction of *supervisory staff* and other occupants in their responsibilities for fire safety,

(d) preparation of diagrams showing the type, location and operation of the *building* fire emergency systems,

(e) holding of fire drills,

(f) control of fire hazards in the *building*, and
(g) inspection and maintenance of *building* facilities provided for the safety of occupants. (See Appendix A.)

* **2.8.2.2. Institutional and Assembly Occupancies.** A sufficient number of *supervisory staff* shall be on duty in an *institutional occupancy* or an *assembly occupancy* to ensure that emergency procedures outlined in the fire safety plan described in Sentence 2.8.2.1.(1) can normally be expected to be carried out within an *accepted* time frame.

2.8.2.3. 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 Article 2.8.2.1., include where applicable
(a) the instruction of *supervisory staff* on the use of the voice communication system,
(b) the procedures for the use of elevators,
(c) the evacuation of non-ambulatory or disabled occupants,
(d) 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, and
(e) procedures established to facilitate fire department access to the *building* and fire location within the *building*.

2.8.2.4. Maintenance 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 and record of the fire emergency systems installed in a *building* within the scope of Subsection 3.2.6. of the Alberta Building Code shall be maintained 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.

2.8.2.5. Distribution. 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*.

2.8.2.6. Posting of Fire Emergency Procedures

(1) A minimum of one copy of the fire emergency procedures shall be prominently posted on each *floor area*.

(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 legible, permanently mounted notice shall be posted at each manually actuated signalling box requesting that the fire department be notified, and including the telephone number of that department.

2.8.2.7. Shutdown of Fire Alarm Systems

(1) When a fire alarm and detection system, or part thereof, is shut off for repairs, or is inoperative for more than 2 hours for any reason, the *owner* shall notify the *local assistant*, and when directed, provide *accepted* surveillance within the *building* continually until the fire alarm and detection system is restored to operating condition. *

(2) *Accepted* procedures 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 in *buildings* specified in Article 2.8.1.1. shall be determined by the fire department in consultation with 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*, and

* (e) the testing and operation of fire emergency systems installed in *buildings* within the scope of Subsection 3.2.6. of the Alberta Building Code.

(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 least once during each 12 month period for the *supervisory staff*, except that

(a) in day care centres and in Group B *major occupancies*, such drills shall be held at least monthly,

(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 an *inspector* or *local assistant* 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 shall be retained by the operator in accordance with Article 1.1.5.1.

Section 2.9 Tents and Air-Supported Structures

2.9.1. General

* **2.9.1.1. Tents and Air-Supported Structures.** Except as provided in Article 2.9.3.5., *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. Flame retardant treatments shall be renewed as often as required to ensure that the material will pass the match flame test in NFPA 701, "Standard Methods of Fire Tests for Flame-Resistant Textiles and Films." (See Appendix A, A-2.3.2.2.(1).)

2.9.3. Fire Hazards and Control

2.9.3.1. Electrical Systems and Equipment

(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 Protection Act and regulations under that 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. Hay, straw, shavings or similar combustible materials other than that 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 may be used if kept damp.

2.9.3.3. Smoking and Open Flame Devices. * Unless *accepted*, no person shall smoke or use an open flame device 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 in * accordance with Sentence (1) shall

(a) be familiar with all fire safety features, including the fire safety plan required in Section 2.8.,

(b) be familiar with the condition and location of *exits*, and

(c) patrol the area to ensure the *means of egress* are free of obstructions, and that applicable regulations are enforced.

* **2.9.3.5. Fire Alarm System.** Where *tents* and *air-supported structures* are designed to accommodate more than 1 000 persons, an *approved* fire alarm and emergency communications system shall be provided. (See Appendix A.)

* **2.9.3.6. Blower Engines.** Internal combustion engines used to power blowers required to be installed in conformance with 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.** Except as provided in Article 1.1.4.1., day care centres shall be constructed in conformance with the requirements of the Alberta Building Code.

2.10.2. Supervision of Children

* **2.10.2.1. Supervision of Children.** 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. Combustible materials such as artwork and teaching materials which are attached to walls shall not exceed 20 per cent of the area of such walls.

2.10.3.2. Waste Receptacles. Waste receptacles shall be made of noncombustible materials.

2.10.3.3. Flammable Liquids and Combustible Liquids. *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. Staff members of day care centres in which more than 10 children are cared for shall conduct monthly fire prevention inspections in conformance with the fire safety plan.

2.10.4.2. Portable Extinguishers. 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. Except as provided in Article 1.1.4.1., *buildings* altered or occupied for purposes of providing accommodation for boarders, lodgers or roomers shall conform to the requirements of the Alberta Building Code. *

2.11.2. Fire Safety Measures

2.11.2.1. Portable Extinguishers. 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.

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) may be used for merchandising or public activities on a temporary basis provided

(a) it conforms to Articles 2.12.1.2. to 2.12.1.8., 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. 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. When a covered mall having a width of 9 m or more 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 may be permitted within the required 9 m width provided alternative protection is installed in conformance with Sentence 1.1.4.1.(2).

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* in a public corridor shall be not more that 15 per cent of the area of the public corridor.

* **(3)** Where the *occupancy* referred to in Sentence (1) 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. 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. Decorative materials used for merchandising or public activities in a covered mall shall conform to the flame resistance and flame retarding requirements in Subsection 2.3.2.

2.12.1.7. Flammable Liquids, Combustible Liquids and Flammable Gases. Unless *accepted*, *flammable liquids*, *combustible liquids* and flammable gases shall not be used or displayed in a covered mall. *

2.12.1.8. Fuelled Equipment. Where a covered mall is used for the display of fuelled equipment, batteries shall be disconnected and fuel tanks shall be not more than half full and provided with locked caps or otherwise secured against tampering. *

Section 2.13 Helicopter Landing Areas On Roofs

2.13.1. Construction

2.13.1.1. Construction. Helicopter landing areas on roofs shall be constructed in conformance with the regulations for Heliports established by Transport Canada.

2.13.2. Fire Safety Measures

2.13.2.1. Fire Separations. 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 other means to notify the fire department in conformance with the Alberta Building Code. *

2.13.2.3. Smoking. 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. Two persons knowledgeable in the use of fire fighting equipment shall be in attendance on the roof deck at each landing area during landings and departures.

* **2.13.2.5. Refuelling, Repair and Maintenance Operations.** Helicopter refuelling, repair and maintenance operations shall not be carried out on helicopter landing areas on roofs except in an emergency and when the procedure has been prepared in cooperation with the *fire authority*.

2.13.2.6. Inspection of Separators. Aviation fuel and oil separators provided in the drainage system shall be inspected weekly to ensure safe operation and shall be serviced when necessary.

Section 2.14 Demolition Sites

2.14.1. General

2.14.1.1. Application

(1) This Section applies to *buildings* or parts of *buildings* undergoing demolition. (See Appendix A.)

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

2.14.1.2. Fire Safety Plan

(1) Prior to commencement of demolition, a fire safety plan conforming to Section 2.8 shall be prepared for the demolition site.

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

2.14.1.3. Fire Safety. Fire safety at demolition sites shall conform to Part 8 of the Alberta Building Code. *

Section 2.15 Construction Sites

2.15.1. General

2.15.1.1. Application. This Section applies to all *buildings* and portions of *buildings* under construction and includes renovations. (See Appendix A.)

2.15.1.2. Fire Safety Plan

(1) Prior to the commencement of construction, a fire safety plan conforming to Section 2.8 shall be prepared for the construction sites.

(2) The fire safety plan shall include
(a) the designation and organization of site personnel to carry out fire safety duties, including watchman services if applicable,
(b) the emergency procedures to be used in the case of fire, including
  (i) sounding the 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*, and
(d) the maintenance of fire fighting facilities.

2.15.1.3. Fire Safety. Fire safety at construction sites shall conform to Part 8 of the Alberta Building Code. *

Section 2.16 Industrial Relocatable Accommodation

2.16.1. General

2.16.1.1. General

(1) In this Section industrial relocatable accommodation means a *building* that is used to pro- *

vide accommodation for an industrial work force that lives and works at a temporary location.

* **(2)** Except as provided in Article 1.1.4.1., 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.

* **(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 Clause (3)(c) 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 2.17 Homes and Hospitals

2.17.1. General

2.17.1.1. 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 Fire Commissioner.

Section 2.18 Assembly Occupancies

2.18.1. General

2.18.1.1. General. Except as provided in Article * 1.1.4.1., *assembly occupancies* shall comply with the Alberta Building Code.

2.18.1.2. Assembly Areas

(1) Aisles and corridors, as required by the * Alberta Building Code, shall be maintained in *assembly occupancies* containing fixed seats.

(2) Every person arranging seating in an * *assembly occupancy* where the seats are not permanently secured in place, shall ensure the seats are arranged so that
  (a) the rows have an unobstructed passage of at least 400 mm measured horizontally between plumb lines from the backs of the seats in one row and the edges of the furthest forward projection of the seats in the next row in the unoccupied position,
  (b) every aisle is located so that there are not more than 7 seats with backs, or 12 seats without backs, between any 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) no dead-end aisle is longer than 6.0 m, and
  (e) 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*.

* **(3)** In an *assembly occupancy* to which Sentence (2) applies, every aisle that serves
(a) 60 seats or less shall be at least 750 mm wide,
(b) seats on one side only shall be at least 900 mm wide, and
(c) more than 60 seats in total on both sides shall be at least 1.1 m wide.

* **(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®."

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

Part 3
Industrial and Commercial Occupancies

Part 3
Industrial and Commercial Occupancies

Section 3.1 General

3.1.1. Scope

* **3.1.1.1. Scope.** This Part provides for life safety and property protection in *assembly*, *mercantile* and *industrial occupancies* by requiring that certain fire protection measures be applied in specific *occupancies* where the use, storage and handling of hazardous materials or the stockpiling of combustible materials create a serious fire hazard.

Section 3.2 Wood Products

3.2.1. Woodworking Plants

3.2.1.1. Outdoor Lumber Storage. The outdoor storage of lumber shall conform to Subsection 3.2.2.

3.2.1.2. Exhaust Systems

* **(1)** Unless *accepted*, every machine that produces wood dust, particles or shavings shall be provided with a blower and exhaust system installed in conformance with NFPA 91, "Installation of Blower and Exhaust Systems for Dust, Stock and Vapor Removal or Conveying."

(2) Operations that generate sparks or combustible vapours shall not be served by woodworking exhaust systems.

3.2.1.3. Shavings and Sawdust Collection. Loose shavings and sawdust shall be collected at frequent intervals and deposited in receptacles described in Article 2.4.1.5.

3.2.1.4. Fire Extinguishers. A portable extinguisher or a garden-type hose conforming to Article 6.2.3.4. shall be provided within 7.5 m of any machine producing wood dust, particles or shavings.

3.2.1.5. Heat-Producing Appliances. Where electrically heated glue pots, soldering irons or other heat-producing *appliances* are in use, they shall be provided with an indicating switch and a red pilot light.

3.2.1.6. Flammable Liquids and Combustible Liquids

(1) The storage and handling of *flammable liquids* or *combustible liquids* shall conform to Part 4.

(2) Spray coating operations using *flammable liquids* or *combustible liquids* in woodworking plants shall conform to Part 5.

3.2.2. Outdoor Storage of Lumber and Forest Products

(See Appendix A.)

3.2.2.1. Site Preparation

(1) Except as permitted in Sentence (2), the storage site for lumber and other forest products shall be level, solid ground, paved or surfaced with material such as cinders, gravel or crushed stone.

(2) Soft storage beds may be used for logs where stones or cinders may become embedded and cause damage to cutting knives.

(3) Piling of forest products on refuse or sawdust-filled land shall not be permitted except where the site is covered with a layer of compacted earth to a minimum depth of 150 mm.

3.2.2.2. Clearances

* **(1)** To minimize fire exposure, yard storage areas for forest products shall be separated from mill operations and other structures by an *accepted* clear space permanently available for fire fighting operations. (See Appendix A.)

(2) In retail and wholesale lumber storage yards, *stickered lumber piles* shall be located not less than 15 m from property lines or *buildings*. (See Appendix A.)

(3) Storage yards 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.

(4) Lumber and timber treated with *combustible liquids* shall be stored in piles that are separated from other stored material so that the distance between piles is at least twice the height of the treated pile, but not less than 4.5 m.

3.2.2.3. Waste Disposal. Sawdust, chips and other waste material shall not be permitted to accumulate in piling areas in retail and wholesale lumber yards.

3.2.2.4. Storage Beneath Power Lines. *Stickered lumber piles* shall not be stored beneath electrical power lines having voltages in excess of 750 V or supplying power to fire emergency systems.

3.2.2.5. Pile Heights

(1) Pile heights for *stickered lumber piles* shall not exceed 6 m.

(2) The height of randomly stacked or unranked piles shall not exceed 6 m unless special extinguishing equipment, such as portable turrets, deluge sets and monitor towers, is installed.

3.2.2.6. Fire Department Access Routes

(1) At least 2 fire department access routes conforming to Subsection 2.5.1. shall be provided to each lumber yard and located as remotely as possible from each other.

(2) Groups of lumber piles shall be arranged with a maximum width of 15 m and a maximum length of 45 m, with fire department access routes surrounding each group.

(3) The overnight parking of vehicles or stacking equipment in a fire department access route less than 7.5 m in width shall not be permitted unless such parking is on one side only, and there is a minimum clear width of 4.5 m for fire department vehicles.

3.2.2.7. Fencing

(1) Where the total area occupied by outdoor lumber storage exceeds 1 000 m^2, the area occupied by the lumber shall be surrounded by a firmly anchored fence that is

(a) substantially constructed to discourage climbing,

(b) not less than 1.8 m high, and

(c) provided with gates not less than 3 m wide, to permit the entry of fire department vehicles, in conformance with Article 3.2.2.6.

(2) The gates required in Clause (1)(c) shall be locked when the lumber storage area is not staffed.

3.2.2.8. Burning of Waste Materials

(1) Shavings, sawdust and refuse materials shall be burned only in *boilers* or *furnaces*, or in incinerators or refuse burners conforming to Subsection 2.6.2.

(2) The refuse burners or incinerators required in Sentence (1) shall be located not less than 15 m from *buildings*, piles of logs or lumber. (See Appendix A.)

(3) A storage bin conforming to Article 2.4.1.5. shall be provided at each *boiler, furnace,* incinerator and refuse burner referred to in Sentence (1).

3.2.2.9. Ignition Sources

(1) Salamanders, braziers or other open flames shall not be used in storage yards.

(2) Smoking shall be prohibited in lumber yards, except as permitted in Subsection 2.4.2.

3.2.2.10. Fire Alarm Boxes and Telephones. The fire department telephone number and location of the nearest fire alarm boxes and working telephones shall be posted conspicuously in working locations in the open yard and in each *building*.

3.2.2.11. Portable Extinguishers

* **(1)** Portable extinguishers conforming to Part 6 or water barrels of not less than 200 L capacity with 3 -12 L pails shall be provided so that the maximum travel distance from any part of the yard to an extinguisher or barrel is 25 m.

(2) Portable extinguishers shall be provided in conformance with Part 6 in each *building* located in a lumber yard.

3.2.2.12. Hydrant Systems

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

* **(2)** Where *accepted*, fire protection may be provided by municipal *street* hydrants and mobile pumping equipment. (See Appendix A.)

3.2.3. Outdoor Storage of Wood Chips

(See Appendix A.)

3.2.3.1. Site Preparation

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

(2) The ground surface between piles shall be kept free of all combustible material.

3.2.3.2. Clearance from Vegetation. Weeds, grass and similar vegetation shall be removed from the yard. (See Appendix A.)

3.2.3.3. Burning of Weeds. Portable open-flame weed burning equipment shall not be used in chip storage yards.

3.2.3.4. Pile Dimensions. Piles shall not exceed 18 m in height, 90 m in width and 150 m in length unless temporary water pipes with hose connections are laid on the top of them.

3.2.3.5. Fire Department Access

(1) Where storage areas are fenced or otherwise enclosed, gates shall be provided to permit the entry of fire department vehicles, but in no case shall the gates be less than 3 m in width.

(2) Access walkways not less than 1.8 m wide shall be provided to the top of piles so that hose streams may be directed on any part thereof.

(3) Piles exceeding 150 m in length shall be provided with at least 2 access walkways on opposite sides thereof and shall be surrounded by fire department access routes at least 9 m wide.

3.2.3.6. Smoking. Smoking shall be prohibited in chip pile areas, except as permitted in Subsection 2.4.2.

3.2.3.7. Portable Extinguishers

(1) Portable extinguishers for *Class A fires* shall be provided on all vehicles operating on chip piles in addition to the extinguishers for *Class B fires* normally required for the vehicles. *

(2) At least 2 portable extinguishers for *Class A fires* with 2-A ratings shall be provided in hydrant houses installed at the perimeter of the piles. *

(3) Portable extinguishers conforming to Part 6 shall be provided in all transfer houses. *

3.2.3.8. Fire Hose and Water Supply.

(1) Not less than two 65 mm hose lines and a water supply capable of delivering water continuously at a minimum rate of 38 L/s shall be provided for the protection of chip piles. *

(2) The hose lines and water supply required by Sentence (1) shall be capable of delivering water to all areas of the chip piles being protected at the rate specified. *

Section 3.3 Indoor Storage

3.3.1. Application

3.3.1.1. Application

(1) Except as permitted in Sentence (2), this Section shall apply to *buildings* or parts of *buildings* used for short or long term storage of raw materials, goods in process or finished goods as classified in Article 3.3.2.1. (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 con-

form to the requirements of this Section, where alternative protection is provided in conformance with Part 1.

3.3.2. General

3.3.2.1. Classification

(1) Products referred to in Article 3.3.1.1. shall be classified as

(a) Class I, II, III or IV commodities, or Group A, B or C plastics, elastomers or rubber in conformance with NFPA-231, "General Storage,"
(b) rubber tires,
(c) Level 1, 2 or 3 aerosols, as described in Subsection 3.3.5.,
(d) *dangerous goods* as described in Subsection 3.3.6., or
(e) *prepacked containers* of *distilled beverage alcohols*.

3.3.2.2. Access Aisles

(1) Adequate access for fire fighting purposes shall be provided and maintained to all portions of the premises, in conformance with Sentences (2) to (4).

(2) At least one main aisle shall extend the length of the *building* with 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.

(See Appendix A.)

(3) Access aisles not less than 1 m wide shall be provided to *exits*, to fire department access panels and to fire protection equipment. (See Appendix A.)

(4) Aisles shall be maintained free of obstruction.

3.3.2.3. 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 at least 400 mm shall be maintained when the quantity of *dangerous goods* stored in a *building* exceeds the quantities shown in Table 3.3.6.A.

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

(4) If the top of the 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 the top of the storage and ceiling sprinkler deflectors shall not be less than 450 mm.

(6) The clearance between stored products and duct or blower systems shall be maintained in conformance with Section 2-8 of NFPA 91, "Blower and Exhaust Systems for Dust, Stock and Vapour Removal or Conveying." (See Appendix A.)

3.3.2.4. Pallets and Storage Aids

(1) Except as permitted in Sentences (2) and (3), combustible pallets and storage aids shall be stored outdoors and located or protected so as to avoid creating an exposure hazard.

(2) Indoor storage of combustible pallets and * storage aids is permitted in *buildings* that are not *sprinklered*, provided the aggregate area of the pallets and aids does not exceed 100 m^2, and the pile dimensions do not exceed 1.2 m high by 7.5 m wide.

(3) The dimensions of piles of combustible pallets and storage aids are permitted to exceed the values in Sentence (2) in *buildings* that are *sprinklered*, where the sprinkler system and storage arrangements in the pallet storage area conform to the requirements of NFPA 231, "General Storage." (See Appendix A.)

(4) Aisles separating piles of combustible pallets or storage aids inside *buildings* shall be not less than 2.4 m wide.

3.3.2.5. Portable Extinguishers. Except as provided in Article 3.3.4.5., portable extinguishers shall be provided in conformance with Part 6.

3.3.2.6. Fire Safety Plan

(1) A fire safety plan conforming to the requirements of 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 Article 3.3.2.1., 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.

Table 3.3.3.A
Forming Part of Article 3.3.3.2.

Height and Area Limits for Individual Storage Areas				
Product Classification [1]	Unsprinklered *Buildings*		*Sprinklered Buildings*	
	Area, m^2	Height of Storage [2], m	Area, m^2	Height of Storage [2], m
Class I commodities	500	6.5	1500	9.0
Class II commodities	500	6.5	1500	9.0
Class III commodities, Group C plastics, elastomers or rubber	250	4.5	1000	9.0
Class IV commodities, Group B plastics	250	3.6	1000	9.0
Group A plastics, elastomers or rubber	250	1.5	500	6.1
Column 1	2	3	4	5

Notes to Table 3.3.3.A.:

[1] See Article 3.3.3.1.

[2] See Article 3.3.3.2.

3.3.2.7. Location of Hazardous Materials. 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.

3.3.3. General Storage

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

3.3.3.2. Individual Storage Areas

(1) Except as provided in Sentence (2), the size of *individual storage areas* shall not exceed the limits shown in Table 3.3.3.A.

(2) In *buildings sprinklered* in conformance with Clause 3.3.3.3.(2)(c), the height of storage *racks* of Class I to IV commodities, Group B or C plastics, and *distilled beverage alcohol* is permitted to exceed 9 m. (See Appendix A.)

3.3.3.3. Sprinkler System Design and Installation

(1) Where a sprinkler system is required to accommodate *individual storage areas* in Article 3.3.3.2., the sprinkler system shall be designed and installed in conformance with Sentences (2) to (4).

(2) For Class I, II, III, or IV commodities, and Group B or C plastics, elastomers or rubber, the sprinkler system 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 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 *prepackaged containers* of *distilled beverage alcohol*, the sprinkler system in Sentence (1) shall be designed in conformance with good engineering practice. (See Appendix A.)

3.3.4. Tire Storage

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

3.3.4.2. Fire Separations. A tire storage area designed to contain more than 375 m^3 of rubber tires shall be separated from the remainder of the *building* in conformance with the requirements of the Alberta Building Code. (See Appendix A.) *

3.3.4.3. Sprinkler Protection

(1) A *building* 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^2,

(b) any *individual storage area* exceeds 250 m^2, 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^3.

3.3.4.4. Clearance from Sprinklers. A clearance of not less than 900 mm shall be maintained between the top of storage and sprinkler deflectors.

3.3.4.5. Portable Extinguishers. In addition to the requirements of Part 6 of this Code, multi-purpose dry chemical portable extinguishers, rated 4-A 20-B shall be installed in conformance with NFPA-10, "Portable Fire Extinguishers," except that there shall be one such extinguisher for every 500 m^2 of *floor area*, and the travel distance to any extinguisher shall not exceed 25 m.

3.3.5. Storage of Aerosol Products

3.3.5.1. Application. This Subsection shall apply to the storage of aerosol products containing a flammable base product or flammable gas propellant.

3.3.5.2. Flammable Base Product Criterion. For the purposes of this Subsection, the base product in Article 3.3.5.1. is considered to be flammable if its closed cup *flash point* is below 400°C.

3.3.5.3. Classification

(1) For the purposes of this Subsection, aerosol products shall be classified as Level 1, 2 or 3 in conformance with Sentences (2) to (5).

(2) Aerosol products having not more than 25 per cent by weight of flammable base product shall be classified as Level 1 aerosols.

(3) Aerosol products having 25 to 100 per cent by weight of water-miscible flammable base product, or 25 to 55 per cent of non-water-miscible flammable base product shall be classified as Level 2 aerosols.

(4) Aerosol products having more than 55 per cent by weight of non-water-miscible flammable base products shall be classified as Level 3 aerosols.

(5) Aerosol products that contain more than 50 per cent by weight of flammable gas propellant shall be classified one hazard level higher than would otherwise be determined by Sentences (2) or (3).

(6) Aerosol products that contain 80 percent or more by weight of flammable gas propellant shall be classified as Level 3 aerosols.
(See Appendix A.)

Table 3.3.5.A

Forming Part of Article 3.3.5.5.

Maximum Amount of Packaged Level 2 or Level 3 Aerosol Products Permitted to be Stored, kg [1]						
Aerosol Products Classification	Type of Dedicated Area					
	Unsprinklered *Building*			*Sprinklered Building* [2]		
	None	A[3]	B[4]	None	A[3]	B[4]
Level 2	1000	4000	8000	4000	No Limit	No Limit
Level 3	250	1000	2000	1000	4000	No Limit
Column 1	2	3	4	5	6	7

Notes to Table 3.3.5.A.:

[1] One pallet load of packaged aerosols is approximately 1000 kilograms.
[2] See Article 3.3.5.6.
[3] See Article 3.3.5.7.
[4] See Article 3.3.5.8.

3.3.5.4. Protection of Level 1 Aerosols. Packaged Level 1 aerosol products shall be protected as required for Class III commodities, in both palletized and *rack* storage, in conformance with Article 3.3.3.2.

3.3.5.5. Protection of Level 2 and 3 Aerosols

(1) The storage of packaged Level 2 or 3 aerosol products shall conform to Table 3.3.5.A.

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

3.3.5.6. Sprinkler System Design and Installation. Where a sprinkler system is required to accommodate the storage limits in Sentence 3.3.5.5.(1), the sprinkler system shall be designed and installed in conformance with Sentence 3.3.3.3.(2), with additional sprinkler protection provided in conformance with good fire protection engineering practice for areas in which packaged aerosol products are stored. (See Appendix A.)

3.3.5.7. Type A Dedicated Areas

(1) Where a Type A dedicated storage area is required to accommodate the storage limits in Sentence 3.3.5.5.(1), it shall be separated from the remainder of the *building* by a chain link fence conforming to Sentence (2), or by 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 required in Sentence (1) shall be not lighter than 3.8 mm steel wire woven into a 50 mm diamond mesh.

3.3.5.8. Type B Dedicated Areas. Where a Type B dedicated storage area is required to accommodate the storage limits in Sentence 3.3.5.5.(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*.

3.3.5.9. 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

(a) 1.75 m where products are in solid piles or on pallets, or

(b) 6.1 m where products are on *racks*.

(2) Where the *building* is *sprinklered* in conformance with Article 3.3.5.6., and an enclosure conforming to Articles 3.3.5.7. or 3.3.5.8. is provided, the height of storage of packaged Level 2 or 3 aerosols shall not be greater than

(a) 6.1 m where products are in solid piles or on pallets, or

(b) the height limit determined by the design capacity of the sprinkler system where products are on *racks*.

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

3.3.6. Storage of Dangerous Goods

3.3.6.1. Application

(1) Except as provided in Parts 4 and 5, this Subsection shall apply to *buildings* or parts of *buildings* where *dangerous goods* are stored or used.

(2) The storage and handling of *dangerous goods* in quantities greater than shown in Table 3.3.6.A., in a single *fire compartment*, shall conform to the requirements of this section.

(3) When a product has a primary and a subsidiary classification, the lesser of the two small quantity exemptions shall apply.

(4) Class 9 *dangerous goods* shall be stored according to the hazard they present.

3.3.6.2. Ignition Sources

(1) Fuel-burning *appliances* shall not be permitted in a *fire compartment* used for the storage of flammable or oxidizing *dangerous goods*.

(2) Smoking shall not be permitted within a *fire compartment* used for the storage of *dangerous goods*.

3.3.6.3. Ventilation. Rooms or parts of *buildings* used for the storage of products capable of generating flammable vapours under normal ambient conditions shall be provided with an *accepted* ventilation system. (See Appendix A.)

3.3.6.4. 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.

3.3.6.5. Storage Heights

*| **(1)** Storage of *dangerous goods* that exceed a height of 1.75 m shall be on *racks* or shelves.

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

*| **(3)** *Dangerous goods* shall not be piled to a height greater than 6.1 m above floor level.

3.3.6.6. 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 3.3.6.B. and Part 5 of this Code.

(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 goods*. (See Appendix A.)

(3) Separation of explosives or radioactive substances from other *dangerous goods* shall be in conformance with Sections 5.2 and 5.9 of this Code, respectively.

*| **3.3.6.7. Corrosion Protection.** Measures shall be taken to prevent or minimize corrosion or deterioration of shelving, *racks* or piping system components.

*| **3.3.6.8. Flooring Materials.** Floors in areas where *dangerous goods* are stored shall be constructed so as to be impermeable to the materials being stored.

3.3.6.9. Fire Suppression Systems

(1) Except as permitted in Sentences (2) and (3), *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

(a) the sum of *individual storage areas* in the *building* used for the storage of *dangerous goods* does not exceed 100 m^2, and

(b) the *dangerous goods* are separated in conformance with the requirements of Table 3.3.6.B. and are 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 containers of non-flammable, non-corrosive, non-poisonous or non-oxidizing *compressed gas*.

3.3.6.10. Smoke Venting. Where the collective *individual storage areas* for *dangerous goods* exceed 10 m^2 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.)

3.3.6.11. Spill Control

(1) Spills of liquid or solid *dangerous goods* shall be prevented from entering public sanitary and storm sewer systems, natural waterways or potable water sources, by

(a) constructing noncombustible sills, curbs or dikes of sufficient height to contain the spills, or

(b) grading the site or sloping the floor to divert liquids to a drainage system conforming to Subsection 4.1.6.
(See Appendix A.)

3.3.6.12. Fire Department Access

(1) Except as provided in Sentences (2) and (3), fire department access to *buildings* described in Article 3.3.6.1. shall be in conformance with Section 2.5.

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

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

* **3.3.6.13. Labels.** 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 are otherwise removed. (See Appendix A.)

3.3.6.14. 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 in conformance with Sentences (2) to (5). (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 3.3.2.6.

* ### 3.3.6.15. Training

(1) In *buildings* regulated by this Subsection, at least one person shall be assigned responsibility for safe operations during business hours and for responding in the event of an emergency at any hour, day or night.

(2) A person described in Sentence (1) shall be trained in conformance with Transport of Dangerous Goods Regulations in the correct procedures for handling, storing and offering for transport of *dangerous goods*.

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

Section 3.4 Industrial Trucks

3.4.1. General

3.4.1.1. 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, "Fire Safety Standard For Powered Industrial Trucks."

(2) Fuel-fired industrial trucks shall conform to ULC-C558, "Guide for the Investigation of Internal Combustion Engine-Powered Industrial Trucks."

(3) Battery-powered industrial trucks shall conform to ULC-C583, "Guide for the Investigation of Electric Battery Powered Industrial Trucks."

(4) Propane cylinders shall be stored in conformance with the Gas Protection Act and regulations under that Act. *

Section 3.5 Salvage Shops and Salvage Yards Including Automobile Wrecking Yards

3.5.1. General

3.5.1.1. Roof Storage. The roof of a *building* located in a salvage yard shall not be used for storage purposes.

3.5.1.2. Open Fires. Fires shall not be permitted in a salvage yard except when used for heating purposes or for operating machinery or equipment.

Table 3.3.6.A.
Forming Part of Sentence 3.3.6.1.(2)

Small Quantity Exemptions for Dangerous Goods		
Class	*Dangerous Goods*	Maximum Exempt Amount
1	Explosives	(See Section 5.2)
2	Gasses	
	Div. 1 Flammable	25 kg
	Div. 2 Non-flammable	150 kg
	Div. 3 Poisonous	0
	Div. 4 Corrosive	0
3	Flammable Liquids and Combustible (1) Liquids	(See Part 4)
4	Flammable Solids	
	Div. 1 Flammable Solids	100 kg(2)
	Div. 2 Subject to spontaneous ignition	50 kg
	Div. 3 Reactive with water	50 kg
5	Oxidizing Substances	
	Div. 1 Oxidizers	250 kg or 250 L
	Div. 2 Organic peroxides	100 kg or 100 L
6	Poisonous and Infectious Substances	
	Div. 1 Poisonous substances	
	Packing Group I(3)	0
	Packing Group II	100kg or 100 L
	Packing Group III	1000 kg or 1000 L
	Div. 2 Infectious substances	0
7	Radioactive Materials	(See Section 5.9)
8	Corrosives (4)	
	Packing Group I	500 kg or 500 L
	Packing Group II	1000 kg or 1000 L
	Packing Group III	2000 kg or 2000 L
9	Miscellaneous	
	Div. 1 Miscellaneous	Other authority (5)
	Div. 2 Environmental	Other authority
	Div. 3 Specific wastes	Other authority
Column 1	2	3

Notes to Table 3.3.6.A.:

(1) The Transportation of Dangerous Goods Regulations define "flammable liquids" as liquids having a flash point of 61°C or below. The NFC defines "combustible liquids" as liquids having a *flash point* between 37.8°C and 93.3°C, and "flammable liquids" as having a *flash point* below 37.8°C.

(2) See Article 5.3.1.2.

(3) The Transportation of Dangerous Goods Act defined "packing group" as "a level of hazard inherent to dangerous goods." Packing Group I products are more hazardous than Packing Group III products.

(4) The Transportation of Dangerous Goods Act uses the expression "corrosives" rather than *corrosive substances.*

(5) Other authorities include the Transportation of Dangerous Goods Act, the Workplace Hazardous Materials Identification System (WHMIS), and environmental protection legislation.

Table 3.3.6.B.
Forming Part of Article 3.3.6.6.

Separation Chart for Storage of Dangerous Goods

		Explo-sives	Flam gas	Non-flam. gas	Poison gas	Corr. gas	Flam. liquids	Flam. solids	Spontan combust	Danger-ous when wet	Oxidizers	Organic peroxide	Poison	Radio-actives	Corro-sives
		1.0[4]	2.1	2.2	2.3	2.4	3	4.1	4.2	4.3	5.1	5.2	6	7	8
Explosives	1.0	–	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)	(1)
Flammable gas	2.1	(1)	–	P	X	X	P	P	A	DS	X	X	X	(2)	X
Non-flammable gas	2.2	(1)	P	–	P	P	P	P	P	P	P	P	P	(2)	P
Poison gas	2.3	(1)	X	P	–	A	X	A	A	DS	A	X	P	(2)	A
Corrosive gas	2.4	(1)	X	P	A	–	X	A	A	DS	A	X	DS	(2)	A
Flammable liquids	3	(1)	P	P	X	X	–	P	A	A	X	X	DS	(2)	A
Flammable solids	4.1	(1)	P	P	A	A	P	–	A	DS	X	X	DS	(2)	A
Spontaneously Combust.	4.2	(1)	A	P	A	A	A	A	–	DS	X	X	DS	(2)	A
Dangerous when wet	4.3	(1)	DS	P	DS	DS	A	DS	DS	–	X	X	DS	(2)	X
Oxidizers (3)	5.1	(1)	X	P	A	A	X	X	X	X	–	P	DS	(2)	X
Organic Peroxide	5.2	(2)	X	P	X	X	X	X	X	X	P	–	DS	(2)	A
Poison	6	(1)	X	P	P	DS	DS	DS	DS	DS	DS	DS	–	(2)	A
Radioactives	7	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	2)	(2)	–	(2)
Corrosives	8	(1)	X	P	A	A	A	A	A	X	X	X	A	(1)	–
Column 1		2	3	4	5	6	7	8	9	10	11	12	13	14	15

Notes to Table 3.3.6.B.:
(1) See Section 5.2
(2) See Section 5.9
(3) Includes gaseous oxidizers, Class 2.2(5.1)
(4) The numbers refer to the Class and Division of dangerous goods, as defined in the Transportation of Dangerous Goods Regulations.

X Incompatible items, do not store together in same fire compartment
A Incompatible items, separate by minimum 1m horizontal distance
P Permitted, items may be stored together
DS Refer to Material Safety Data Sheet

3.5.1.3. Fencing

(1) Salvage yards of more than 1000 m^2 shall be surrounded by a firmly anchored fence that is

(a) substantially constructed to discourage climbing,

(b) not less than 1.8 m high, and

(c) provided with gates not less than 3 m wide, to permit the entry of fire department vehicles.

(2) The gates required in Clause (1)(c) shall be locked when the salvage yard is not staffed.

3.5.1.4. Spill Control. Provision shall be made for the safe drainage and disposal of fuel or *used oil* emptied from vehicles, tanks or other containers, in conformance with Subsection 4.5.7.

3.5.2. Piling

3.5.2.1. Piles

(1) Piles which include combustible salvage shall be at least 3m from property lines and not more than 3m in height and 100 m^2 in area.

(2) Piles of salvage material shall be separated by a clear space of 3 m, and this space shall be kept clear of all grass and weeds.

(3) Tanks or *drums* shall be stored in piles separate from piles of other materials.

* 3.5.3. Outdoor Storage of Used Tires

3.5.3.1. Application. This Subsection shall apply to the outdoor storage of tires or shredded tires where the bulk volume of stored product exceeds 300 m^3. (See Appendix A.)

3.5.3.2. 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.)

3.5.3.3. 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^3,

(b) an *individual storage area* of 100 m^2, 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 greater distance.

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

3.5.3.4. Fire Break

(1) A 22 m fire break shall be provided around the perimeter of individual storage piles where

(a) the total bulk volume of stored tires or shredded tires is greater than 4 800 m^3, or

(b) there are 16 storage piles with an individual storage volume of 300 m^3 each.

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

3.5.3.6. 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 2A-20BC portable fire extinguisher.

3.5.3.7. 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 3.5.3.1.

(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 an *inspector* or *local assistant*.

(3) Access to heavy-duty equipment such as bulldozers, front-end loaders and similar equipment shall be included in the fire safety plan.

3.5.3.8. 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.

3.5.3.9. Fencing

(1) Where the total bulk of stored tires or shredded tires is more than 600 m^3, the area occupied by the tires shall be fenced in conformance with Article 3.2.2.7.

3.5.3.10. Maintenance. 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.

3.5.3.11. 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 *fire authority*, 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^3, or

(b) at least 8 000 L/m if the storage area is equal to or greater than 600 m^3.

(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.

Section 3.6 Cleaning and Dyeing Plants

3.6.1. General

3.6.1.1. Dry Cleaning Plants. Dry cleaning plants shall conform to NFPA 32, "Drycleaning Plants."

Section 3.7 Industrial Oven for Baking and Drying Processes

3.7.1. Application

3.7.1.1. Application. This Section applies to industrial baking and drying ovens which during operation contain flammable vapours given off by the products being baked or dried.

3.7.2. Location

3.7.2.1. Location. Ovens shall not be located in any *storey* of a *building* below grade.

3.7.3. Construction

3.7.3.1. Installation. Except as provided in Article 1.1.4.1., industrial ovens described in Article 3.7.1.1. shall be installed in conformance with the Alberta Building Code. *

3.7.4. Maintenance *

3.7.4.1. 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).

* 3.7.5. Fire Protection

3.7.5.1. Portable Extinguishers. Portable extinguishers shall be provided in conformance with Part 6.

*** 3.7.5.2. Standpipe and Hose Systems**

(1) A standpipe and hose system shall be installed in conformance with the Alberta Building Code.

(2) The standpipe and hose system required in Sentence (1) shall be equipped with shutoff spray nozzles so that all parts of the oven structure can be reached by a hose stream.

3.7.5.3. Fire Access Doors. Doors or other means of access shall be provided in ovens and associated ductwork so that portable extinguishers or hose streams may be used in all parts of the equipment.

3.7.5.4. Fire Extinguishing Systems. Ovens containing or processing sufficient combustible materials to sustain a fire shall be protected by an automatic sprinkler or other fixed fire extinguishing system.

Section 3.8 Bowling Alleys

3.8.1. Resurfacing

*** 3.8.1.1. Public Access.** No person shall resurface bowling alleys while they are open to the public.

3.8.1.2. Sources of Ignition. All mechanical exhaust systems, electric motors and other equipment which might be a source of ignition shall be shutdown, and smoking and the use of open flames or lights shall be prohibited during the application of flammable finishes and for at least 1 h after such application. *

3.8.2. Pin Refinishing

3.8.2.1. Fire Separation and Ventilation. Pin refinishing shall be carried out in a *building* provided for the purpose, or in a room at or above grade separated by walls, floor and ceiling assemblies having at least a 1 h *fire-resistance rating*.

3.8.2.2. Ventilation. Rooms and *buildings* described in Article 3.8.2.1. shall be provided with mechanical ventilation conforming to Subsection 4.1.7.

3.8.2.3. Smoking. Smoking shall not be permitted in a refinishing room.

3.8.3. Flammable Liquids and Combustible Liquids

3.8.3.1. Storage. The storage of *flammable liquids* and *combustible liquids* in a bowling alley shall conform to Part 4.

3.8.3.2. Waste Receptacles. A receptacle conforming to the requirements in Article 2.4.1.5. shall be provided for all waste rags and materials used in operations involving flammable finishes or solvents, and the contents shall be removed daily and disposed of in a manner that will not create a hazard.

Part 4
Flammable and Combustible Liquids

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 places. (See Appendix A.)

(2) Areas in process plants need not conform to the requirements of this Part where

(a) conditions must be addressed by design and operating details specific to the hazard, and

(b) alternative protection is provided that conforms to 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) oil-burning *appliances* and equipment within the scope of CAN/CSA B139, "Installation Code for Oil Burning Equipment,"

(c) the storage of *flammable liquids* or *combustible liquids* on farms for individual farm use and at isolated construction projects,

(d) the storage of *flammable liquids* or *combustible liquids* in aerosol containers covered under Subsection 3.3.5.,

(e) liquified petroleum gas-burning *appliances* and equipment within the scope of the Gas Protection Act, *

(f) the production, storage or handling of liquefied natural gas within the scope of the Gas Protection 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 or production. *

4.1.1.2. Approval

(1) Only *approved* personnel are permitted to install, test, maintain, alter, upgrade, remove or dispose of *storage tank systems* identified in this Part.

(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 municipality having jurisdiction,

(b) plans, drawings and specifications of the system or equipment have been examined by the *Fire Authority*, 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

(1) This Article does not apply to
(a) an above ground *storage tank* with a capacity of less than 2 500 L,
(b) a *storage tank* in an industrial *process plant*, a *refinery* or a *distillery*,
(c) a flow through process tank, or
(d) a *pressure vessel* that is used as a *storage tank* and is registered in accordance with the Boilers and Pressure Vessels Act.

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

(3) The *owner* of a *storage tank* shall ensure that an application for registration as required by Sentence (4) is submitted before August 31, 1993.

(4) An application for registration shall be
(a) made on an *approved* form,
(b) submitted to an *inspector*, and
(c) accompanied by a registration fee in the amount of sixty dollars ($60.00) per tank.

(5) Where two or more *storage tanks* are interconnected, each tank shall be registered separately.

(6) Sentences (2), (8) and (10) shall not apply until August 31, 1993.

(7) On receipt of a duly completed application and the registration fee, an *inspector* may register the *storage tank* and issue a registration certificate and registration tag.

(8) The *owner* of the *storage tank* shall ensure that
(a) the registration certificate required by Sentence (7) is displayed on the premises where the *storage tank* is located, and
(b) the registration tag required by Sentence (7) is affixed to the fill pipe or the side of the fill box.

(9) A registration certificate
(a) expires on the third anniversary of the date of issue and is renewable for additional 3-year periods on the payment of the fee referred to in Sentence (4),
(b) is valid only while the *storage tank* remains at the location described in the certificate, and
(c) is not transferrable.

(10) 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,
(b) the registration certificate is displayed as required by Clause (8)(a), and
(c) the registration tag required by Clause (8)(b) is attached to the fill pipe or the side of the fill box.

(11) The *owner* of a *storage tank* shall ensure that a record is kept at the premises where the *storage tank* is located 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*.

(12) The *owner* shall make the record described in Sentence (11) available to an *inspector* or *local assistant* when requested to do so.

(13) An *inspector* may cancel the registration of a *storage tank* under this Article if
(a) the *inspector* has reasonable grounds to suspect that the *storage tank* is leaking,
(b) the registration fee is not paid,
(c) the *storage tank* is out of service as described in Subsections 4.10.2. or 4.10.3., or
(d) the *storage tank* has not been installed in accordance with Article 4.3.8.1. or upgraded in accordance with Article 4.3.18.3.

(14) 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 and registration tag to an *inspector* within 30 days.

(15) The *owner* of a *storage tank* shall forthwith notify an *inspector* if a registration certificate or registration tag is lost, stolen or destroyed.

(16) Upon receiving notification from an *owner* that a registration certificate or registration tag has been lost, stolen or destroyed, an *inspector* may issue a replacement without fee.

(17) Where a registered *storage tank* is replaced, materially modified, or altered to satisfy an upgrading requirement of Article 4.3.18.3., the *owner* shall apply for a new registration certificate and registration tag in accordance with Sentence (4) within 30 days after substantial completion of the modifications, alterations, or replacement.

(18) No fee is payable on an application under Sentence (17).

(19) The *owner* of a *storage tank* shall notify an *inspector*, in writing, of the sale, lease or other transfer of ownership or any re-location of the *storage tank*.

(20) 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 (19), an *inspector* may issue a new registration certificate and registration tag, without fee, that reflects the new ownership or the new location.

4.1.2. Product Classification

4.1.2.1. Product Classification

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

(See Appendix A.)

(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 Combustible Liquids. When a *combustible liquid*, or any liquid having a *flash point* at or above 93.3°C, is being processed, stored, handled or used at a temperature at or above its *flash point*, it shall be treated as a *flammable liquid*.

4.1.3. Flash Point

4.1.3.1. Determination of Flash Point

(1) Except as provided in Sentences (3) and (4), the *flash point* of liquids having viscosity less than 6 mm^2/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 the Tag Closed Tester."

(2) Except as provided in Sentences (3) and (4), the *flash point* of liquids having a viscosity of 6 mm^2/s or more at 37.8°C or a *flash point* of 93.3°C or higher shall be determined in conformance with ASTM D93, "Flash Point by the Pensky-Martens Closed Tester."

(3) ASTM D3828, "Standard Methods of Tests for Flash Point of Petroleum Products by Setaflash Closed Tester," is permitted to be used for testing aviation turbine fuels within the scope of this procedure.

(4) ASTM D3278, "Standard Method of Tests for 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^2/s (150 stokes) at 25°C. (See Appendix A.)

4.1.4. Electrical Equipment

4.1.4.1. Electrical Equipment. Electrical equipment that is located in an area where *flammable liquids* or *combustible liquids* are present shall conform to the requirements of the Electrical Protection Act and regulations under that Act. *

4.1.5. Fire Prevention and Protection

4.1.5.1. General. Unless otherwise required in this Part, all fire prevention and protection require-

ments for areas directly involved in the storage, handling and use of *flammable liquids* and *combustible liquids* shall comply with this Subsection.

4.1.5.2. Portable Extinguishers. Portable extinguishers shall be provided and maintained as required elsewhere in this Part and in Part 6.

* **4.1.5.3. Additional Fire Protection Equipment.** In addition to extinguishers required in Article 4.1.5.2., fire protection equipment shall be provided as required by the *Fire Authority* where there are special hazards created by operation, dispensing or storage.

* **4.1.5.4. Ignition Sources.** No person shall use open flames and spark-producing devices in a manner that will create a fire hazard in areas described in Article 4.1.5.1.

4.1.5.5. Smoking

* **(1)** Smoking shall be prohibited in areas where *flammable liquids* or *combustible liquids* are being used, handled or stored, as described in Articles 4.1.5.1. and 4.5.9.1., except that designated smoking areas may be *accepted*.

* **(2)** Signs conforming to Article 2.4.2.2. shall be prominently posted in areas where smoking is prohibited.

4.1.5.6. Removal of Combustibles

(1) Areas described in Article 4.1.5.1. shall be kept clean and free of ground vegetation and accumulations of combustible materials not essential to operations.

(2) Cleaning rags shall be stored in receptacles conforming to Article 2.4.1.5.

4.1.5.7. Emergency Planning

* **(1)** Unless exempted by the *Fire Authority* and except as provided in Sentence (2), emergency planning measures conforming to Section 2.8 shall be provided for all *buildings* or parts of *buildings* 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

(a) retained on site, and

(b) made available, upon request, to an *inspector*, a *local assistant*, or other personnel.

4.1.5.8. Access for Fire Fighting. In an area where *flammable liquids* or *combustible liquids* are used, stored or handled, aisles and other access paths required for the movement of personnel and fire department apparatus during fire fighting operations, shall be maintained free of obstruction at all times. *

4.1.5.9. Welding and Cutting. Welding and cutting operations shall conform to Part 5.

4.1.5.10. Basement Storage

(1) Except as permitted in Sentence (2), no person shall store, handle, or use *flammable liquids* in *basements* other than *

(a) in *basements* of *dwelling units* as described in Article 4.2.4.5., or

(b) in *mercantile occupancies* as described in Sentence 4.2.5.2.(3).

(2) A person may store *flammable liquid* in a basement, provided *

(a) the amount stored does not exceed 5 L,

(b) it is stored in a safety can conforming to Subsection 4.2.3., and

(c) the *flammable liquid* is not Class 1A. (See Appendix A.)

4.1.6. Drainage and Waste Disposal

4.1.6.1. Spill Control

(1) Except at *service stations*, a spill of *flammable liquids* or *combustible liquids* shall be prevented from entering public sanitary or storm sewer systems or natural waterways by

(a) constructing noncombustible sills, curbs or dikes of sufficient height to contain the spill, or

(b) grading the site or sloping the floor to divert it to a drainage system conforming to Article 4.1.6.2.

(2) When dikes are provided to contain accidental spillage in Sentence (1), they shall conform to 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 designed to drain a spill of *flammable liquids* or *combustible liquids* shall terminate at a location where the spill will not create a fire hazard or any risk to public health or safety by contaminating any potable water source, underground stream or waterway, or by entering any sanitary or storm sewer.

(2) Provision shall be made in the design of the drainage system described in Sentence (1) to direct the flow of spilled liquids and fire fighting water 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.

(3) Closed drainage systems shall be equipped with a trap.

* **4.1.6.3. Absorbent Material.** Noncombustible absorbent material shall be provided where *flammable liquids* or *combustible liquids* are used, stored, handled or dispensed.

4.1.7. Ventilation

* **4.1.7.1. Installation.** Where *flammable liquids* and *combustible liquids* are processed, handled, stored, dispensed or used within rooms or enclosed spaces, ventilation shall conform to the Alberta Building Code. (See Appendix A.)

4.1.7.2. Maintenance. 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 Liquids and Combustible Liquids

* **4.1.8.1. Storage Tanks and Containers.** *Flammable liquids* and *combustible liquids* shall be stored in *storage tanks,* or safety cans or containers constructed and installed in accordance with this Part.

4.1.8.2. Control of Static Electric Charge

(1) When *flammable liquids* are dispensed into containers

(a) in the case of metallic or conducting containers, the container shall be electrically connected to the fill stem, or rest on a conductive floor that is electrically connected to the fill stem, or

(b) in the case of non-conducting containers, measures shall be taken to minimize the potential for static electric charge to develop. (See Appendix A.)

4.1.8.3. Transfer

(1) *Flammable liquids* shall be drawn from or transferred into containers or *storage tanks* within a *building* *

(a) through a closed piping system conforming to Section 4.4.,

(b) by means of a pump designed for *flammable liquid* transfer located on top of the *storage tank* or container, or

(c) by gravity through a self-closing valve conforming to CAN/ULC-S620M, "Standard for Hose Nozzle Valves for Flammable and Combustible Liquids."

(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. Dispensing into Fuel Tanks of Vehicles. No person shall dispense *flammable liquids* or *combustible liquids* into the fuel tanks of vehicles or other motorized equipment from moveable *storage tanks* where such an activity would, in the opinion of the *Fire Authority,* cause a hazard. *

4.1.9. Liquid Spills and Leaks

4.1.9.1. Liquid 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 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 leaking shall be removed with the aid of an absorbent and disposed of in an *accepted* manner or shall be flushed to a location conforming to Article 4.1.6.2.

* **(4)** 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) an *inspector* or *local assistant* is notified forthwith if the quantity of liquid spilled or leaked

(i) exceeds 100 L in aggregate, or

(ii) is sufficient to cause a sheen on nearby surface water.

Section 4.2 Container Storage and Handling

4.2.1. Application

4.2.1.1. Application

(1) This Section applies to the storage and handling of *flammable liquids* and *combustible liquids* in *portable tanks, drums, portable containers* and *prepackaged containers* not covered elsewhere in this Part, except that it shall not apply to the following:

(a) containers in *service stations*, bulk plants, and *process plants*, including *refineries* and *distilleries*,

(b) fuel tanks for motors or engines,

(c) *prepackaged containers* of alcoholic beverages, foods and pharmaceutical products, and

(d) other products such as detergents, insecticides and fungicides containing not more than 50 per cent by volume of water-miscible *flammable liquids* or *combustible liquids* with the remainder of the solution being non-flammable.

4.2.2. General

4.2.2.1. Prohibited Locations. *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. Fencing.** An outside storage area of *flammable liquids* or *combustible liquids* shall be fenced in an *accepted* manner where necessary to prevent the entry of unauthorized personnel.

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 Section 3.3 of this Code.

(2) For the purposes of applying Table 3.3.6.B., Class IIIA *combustible liquids* shall be treated as Class 3 *dangerous goods*. (See Appendix A.)

4.2.3. Drums, Portable Containers, Prepackaged Containers and Portable Tanks

4.2.3.1. Containers

(1) Except as permitted in Articles 4.2.3.3. and 4.2.3.4., the storage, handling and use of *flammable liquids* or *combustible liquids* in containers having an individual capacity of less than 249 L shall be permitted only in *

(a) *drums* and *prepackaged containers* meeting the requirements of the Transportation of Dangerous Goods Regulations,

(b) *portable containers* of metal or plastic conforming to CSA-B376, "Portable Containers for Gasoline and Other Petroleum Fuels,"

(c) portable fuel tanks conforming to CSA-B306, "Portable Fuel Tanks for Marine Use,"

(d) safety cans conforming to ULC-C30, "Guide for the Investigation of Metal Safety Containers," and

(e) containers used by regulatory officials for the purpose of collecting samples. (See Appendix A.)

(2) The storage, handling and use of *flammable liquids* or *combustible liquids* in *portable tanks* shall be permitted, provided such tanks are constructed in conformance with 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., all *drums* and *prepackaged containers* for *flammable liquids* or *combustible liquids* shall be dis-

tinctly marked or labelled, in easily legible type which contrasts with any other printed matter on the label with a warning to indicate that the material in the container is flammable, that it should be kept away from heat, sparks and open flames and that it should be kept closed when not in use.

* **(2)** A *drum* or *prepackaged container* labelled in conformance with the requirements of the Transportation of Dangerous Goods Act and its Regulations, or the Hazardous Products Act and its Regulations, is deemed to comply with Sentence (1).

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* and *combustible liquids* in glass or plastic *prepackaged containers* shall be permitted only if

(a) the required liquid purity (such as ACS analytical reagent grade or higher) would be affected by storage in metal containers, or

(b) the liquid would cause excessive corrosion of the metal containers.

4.2.3.4. Other Containers

(1) Except as permitted in Sentence (2), the storage and use of *flammable liquids* and *combustible liquids* having a *flash point* below 60°C, in containers other than those in Article 4.2.3.1., shall not be permitted within a *building*.

(2) Containers of not more than 1 L capacity in the case of *flammable liquids* and 5 L in the case of *combustible liquids* need not conform to Article 4.2.3.1.

4.2.4. Assembly and Residential Occupancies

4.2.4.1. Application. 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 Articles 4.2.4.5. and 4.2.4.6., the maximum quantity of *flammable liquids* or *combustible liquids* stored in a *building* described in Article 4.2.4.1. shall not exceed

(a) 30 L of Class I liquids,

(b) 150 L of Class II liquids, or

(c) 600 L of Class IIIA liquids.

(2) When two 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.

(3) Quantities of *flammable liquids* or *combustible liquids* exceeding those specified in Sentence (1) are permitted, provided they are kept in *

(a) a single storage cabinet conforming to Subsection 4.2.10., or

(b) a storage room having no openings that communicate directly with the public portions of the *building*, and which conforms to Subsection 4.2.9.

4.2.4.3. Storage Cabinets and Storage Rooms. The storage cabinet and storage room in Sentence 4.2.4.2.(3) shall be located on the *first storey*.

4.2.4.4. Exterior Balconies. *Flammable liquids* or *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)** No person shall store more than 50 L of *flammable liquids* or *combustible liquids* in aggregate, in a garage or shed attached to a *dwelling unit.*

* **(2)** The quantity of *flammable liquids* permitted in Sentence (1) shall not exceed 30 L.

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

(a) 8 L/m^2 of the total area of the *suite,* provided that not more than 2 L/m^2 is Class I liquid, and not more than 0.3 L/m^2 of the quantity stored shall be Class IA, Class IB, or any combination of these two classes, or

(b) 8 000 L of *flammable liquids* and *combustible liquids,* provided that not more than 2 000 L is Class I liquid, and not more than 300 L of the quantity stored shall be Class IA, Class IB, or any combination of these two 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

(a) 24 L/m^2 of the total area of the *suite,* provided that not more than 6 L/m^2 is Class I liquid, and not more than 1 L/m^2 of the quantity stored shall be Class IA, Class IB, or any combination of these two classes, or

(b) 24 000 L of *flammable liquids* and *combustible liquids,* provided that not more than 6 000 L is Class I liquid, and not more than 1 000 L of the quantity stored shall be Class IA, Class IB, or any combination of these two classes.

(4) For the purposes of calculating permissible quantities in Sentences (2) and (3), *mercantile occupancies* of less than 250 m^2 *floor area* shall be assumed to be 250 m^2 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 *prepackaged containers.*

(2) *Prepackaged containers* of Class I and Class II liquids shall not be stacked more than 1.5 m high on floors, or 1 m high on individual fixed shelves.

(3) *Flammable liquids* in *prepackaged containers* are permitted to be stored in *basements* of *mercantile occupancies.*

4.2.5.3. Transfer. 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 Institutional Occupancies

4.2.6.1. Application. This Subsection shall apply to the storage, handling and use of *flammable liquids* and *combustible liquids* in *business and personal service occupancies* and *institutional 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., no person shall store *flammable liquids* or *combustible liquids* other than

(a) in a *closed container,* stored in a cabinet conforming to Subsection 4.2.10., or

(b) in a room having no openings communicating directly with the public portions of the building and which conforms to Subsection 4.2.9.

4.2.6.3. Maximum Quantities

* **(1)** Except as provided in Sentence (2) and Sentence 4.2.6.5.(4), the storage of *flammable liquids* and *combustible liquids* outside of a cabinet or room as specified in Article 4.2.6.2. is permitted, provided such storage does not exceed
  (a) 10 L, including a maximum of 5 L of Class I liquid, in a single room, or
  (b) 250 L, including a maximum of 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 a maximum of 25 L of *flammable 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* or laboratory, metal safety cans conforming to Clause 4.2.3.1.(1)(d), with a maximum of 25 L capacity, shall be used.

(2) Containers of *flammable liquids* or *combustible liquids* shall be kept closed when not in use.

4.2.6.5. Laboratories

(1) The storage and handling of *flammable liquids* and *combustible liquids* in laboratories in *occupancies* and facilities described in Article 4.2.6.1., shall conform to Sentences (3) to (5).

(2) Storage and handling of *flammable liquids* and *combustible liquids* in laboratories not within the scope of Sentence (1) shall conform to the requirements of this Part for *industrial occupancies*.

* **(3)** Except as provided in Sentence 4.2.6.4.(1), containers used for the storage of *flammable liquids* or *combustible liquids* in laboratories shall be a maximum of 5 L capacity and shall conform to Subsection 4.2.3.

* **(4)** Except as permitted in Sentence (6), not more than 300 L of *flammable liquids* and *combustible liquids* shall be permitted in the open laboratory area.

(5) The quantity of *flammable liquid* permitted * in Sentence (4) shall not exceed 50 L.

(6) Quantities in excess of those permitted in Sentence (4) shall be stored in cabinets conforming to Subsection 4.2.10. or in a room conforming to Subsection 4.2.9.

4.2.6.6. Separation of Dangerous Goods.

Flammable liquids or *combustible liquids* 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*, *drums*, or *portable tanks* in *industrial occupancies*.

(2) Except as provided in Article 1.1.4.1., * *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. Fire Compartments.

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.

Except as permitted in Subsection 4.2.8., the dispensing or transfer of *flammable liquids* or *combustible liquids* from one container to another shall be conducted in rooms conforming to 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 *industrial occupancies* described in Article 4.2.7.1.

shall conform to Table 4.2.7.A., or, where stored in *racks* in *buildings* protected in conformance with Article 4.2.7.7., with Table 4.2.7.B.

(2) Where a *building* is designed for the storage of *flammable liquids* or *combustible liquids*, and is either separated from adjacent *buildings* by a *firewall* having a *fire-resistance rating* of at least 4 h, or is spatially separated from adjacent *buildings* in conformance with the Alberta Building Code, total quantities of storage are permitted to exceed those in Tables 4.2.7.A. and 4.2.7.B., in conformance with Clauses (a) and (b)

(a) in protected storage, there is no limit on total quantities permitted in Column 5 of Table 4.2.7.A., or in Table 4.2.7.B.,

(b) in unprotected storage, twice the quantities in Column 8 in Table 4.2.7.A. are permitted. (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 two or more classes of liquids are stored in a single *storey*, 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 Tables 4.2.7.A. or 4.2.7.B. for the arrangement,

Q_{II} = the maximum quantity of Class II liquid permitted in Tables 4.2.7.A. or 4.2.7.B. for the arrangement,

Q_{IIIA} = the maximum quantity of Class IIIA liquid permitted in Tables 4.2.7.A. or 4.2.7.B. for the arrangement.

4.2.7.6. Spill Control. Drainage for spilled *flammable liquids* or *combustible liquids*, including water used for fire fighting, shall be provided in conformance with Subsection 4.1.6.

4.2.7.7. Fire Suppression Systems. 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* or *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. 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 3.3.2.2.

4.2.7.10. Separation from Other Dangerous Goods. *Flammable liquids* or *combustible liquids* shall not be stored with other *dangerous goods* except in conformance with Article 4.2.2.3.

4.2.7.11. Combustible Materials. Combustibles other than those used for the packaging of *flammable liquids* or *combustible liquids* shall not be stored in the same *individual storage area* with such liquids.

4.2.7.12. Absorbents. Noncombustible absorbent materials shall be available in the storage area for use in cleanup of spilled *flammable liquids* or *combustible liquids*.

4.2.7.13. Ventilation. Storage areas described in Article 4.2.7.1. shall be ventilated in conformance with the requirements of Subsection 4.1.7.

Table 4.2.7.A
Forming Part of Article 4.2.7.5.

Indoor Storage of Flammable Liquids and Combustible Liquids in Drums, Portable Containers, and Portable Tanks in Industrial Occupancies (Palletized or Solid Piles Storage)							
		Protected Storage (1)			Unprotected Storage		
Type of Liquid	Storage Level	Maximum Quantity per I.S.A.,(2) L	Maximum Storage Height, m	Maximum(3) Quantity per Storey L	Maximum Quantity per I.S.A.,(2) L	Maximum Storage Height, m	Maximum(3) Quantity per Storey 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	Not Permitted	Not Permitted	Not Permitted
	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*	10 000	2.0	60 000	5 000	1.5	5 000
	Storeys above the *first storey*	7 500	2.0	50 000	Not Permitted	Not Permitted	Not Permitted
	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	5 000	1.5	10 000
	Storeys above the *first storey*	10 000	2.0	50 000	Not Permitted	Not Permitted	Not Permitted
	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*	40 000	3.0	100 000	15 000	1.5	30 000
	Storeys above the *first storey*	40 000	3.0	100 000	5 000	1.5	10 000
	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	4.5	200 000	50 000	3.0	100 000
	Basement	40 000	3.0	100 000	Not Permitted	Not Permitted	Not Permitted
Column 1	2	3	4	5	6	7	8

Notes to Table 4.2.7.A.:
(1) See Article 4.2.7.7.
(2) Individual Storage Area
(3) See Sentence 4.2.7.5.(4)

Table 4.2.7.B.
Forming Part of Sentence 4.2.7.5.

Indoor Storage of Flammable Liquids and Combustible Liquids in Drums, Portable Containers, Portable Tanks and Prepackaged Containers			
Protected Rack Storage Class of Liquid	Storage Level	Maximum Height, m	Maximum Quantity [1] per Storey, L
CLASS IA (*Flash point* below 22.8°C, boiling point below 27.8°C)	*First storey*	7.5	30 000
	Storeys above *first storey*	4.5	17 000
	Basement	Not Permitted	Not Permitted
CLASS IB (*Flash point* below 22.8°C, boiling point at or above 37.8°C)	*First storey*	7.5	60 000
	Storeys above *first storey*	4.5	35 000
	Basement	Not Permitted	Not Permitted
CLASS IC (*Flash point* at or above 22.8°C and below 37.8°C)	*First storey*	7.5	60 000
	Storeys above *first storey*	4.5	35 000
	Basement	Not Permitted	Not Permitted
CLASS II (*Flash point* at or above 37.8°C and below 60°C)	*First storey*	7.5	100 000
	Storeys above *first storey*	7.5	100 000
	Basement	Not Permitted	Not Permitted
CLASS IIIA (*Flash point* at or above 60°C and below 93.3°C)	*First storey*	12.0	200 000
	Storeys above *first storey*	6.0	200 000
	Basement	6.0	200 000
Column 1	2	3	4

Note to Table 4.2.7.B.:
[1] See Sentence 4.2.7.5.(4)

4.2.8. Incidental Use

4.2.8.1. Application. Except as otherwise noted in this Part, this Subsection applies to *industrial occupancies* where the use and handling of *flammable liquids* or *combustible liquids* is secondary to the principal activity. (See Appendix A.)

4.2.8.2. Containers

(1) Where *flammable liquids* or *combustible liquids* are not kept in appropriate storage rooms or cabinets, they shall be kept in *closed containers* or *portable tanks* conforming to Article 4.2.3.1., or in *storage tanks* conforming to Clauses 4.3.1.2.(1)(a) or (1)(b).

(2) Containers of *flammable liquids* or *combustible liquids* shall be kept closed when not actually in use.

4.2.8.3. Maximum Quantities

* **(1)** Except as provided in Sentences (2) and (3), the quantity of *flammable liquids* and *combustible liquids* permitted to be located outside of a storage room or storage cabinet, in any one *fire compartment* of a *building*, shall not be more than

(a) 600 L of *flammable liquids* or *combustible liquids* in aggregate in *closed containers*, and not more than 200L of the quantity stored shall be Class IA liquid, and

(b) 5 000 L of Class IB, IC, II or IIIA liquids in aggregate in *storage tanks* or *portable tanks*.

(2) Where required for normal plant activity, quantities of *flammable liquids* and *combustible liquids* may exceed those permitted 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 (1) are required, such quantities shall be in *storage tanks* installed in conformance with Article 4.3.12.7.

4.2.8.4. Handling

(1) Areas in which *flammable liquids* or *combustible liquids* are transferred from one *storage tank* or container 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 Appendix A.)

(b) provided with a drainage system to control spills in conformance with Subsection 4.1.6.,

(c) provided with noncombustible absorbent materials to assist in cleanup of small liquid spills,

(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.

4.2.9. Rooms for Container Storage

4.2.9.1. Maximum Quantities

(1) Except as provided in Sentence (2), where *flammable liquids* or *combustible liquids* are stored in rooms required in this Part, the storage densities averaged over the total room areas and the total quantities of such liquids shall conform to Table 4.2.9.A.

(2) The maximum quantities and densities of *flammable liquids* and *combustible liquids* permitted in Sentence (1) may be doubled provided the storage room is protected by an automatic sprinkler system in conformance with Article 6.5.1.1. or equivalent fixed extinguishing system. (See Appendix A, A-4.2.7.7.)

Table 4.2.9.A.
Forming Part of Article 4.2.9.1.

Maximum Quantities and Storage Densities for Rooms for Container Storage and Dispensing		
Maximum Total Quantity of Liquid, L	Minimum *Fire Separation* Around Storage Room, h	Maximum Density L/m^2
10 000	2	200
1 500	1	100
Column 1	2	3

4.2.9.2. Spill Control

(1) Storage rooms in Article 4.2.9.1. shall be liquid-tight where the walls join the floor.

(2) Storage rooms 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.** Every storage room in Article 4.2.9.1. shall be ventilated in conformance with the Alberta Building Code.

4.2.9.4. Aisles. The contents of *flammable liquid* and *combustible liquid* storage rooms in Article 4.2.9.1. shall be arranged to provide aisle widths of not less than 1m.

* **4.2.9.5. Dispensing.** Dispensing of *flammable liquids* or *combustible liquids* from drums shall be by pumps or self-closing valves designed for *flammable liquids* or *combustible liquids* dispensing.

4.2.9.6. Portable Extinguishers. Portable extinguishers shall be provided for storage rooms described in Article 4.2.9.1. in conformance with Part6.

4.2.10. Cabinets for Container Storage

4.2.10.1. Containers. *Flammable liquids* or *combustible liquids* stored in cabinets required in this Part shall be in containers conforming to Sentence 4.2.3.1.(1).

* **4.2.10.2. Maximum Quantities.** The aggregate quantity of *flammable liquids* and *combustible liquids* stored a cabinet shall be 500 L, and not more than 250 L of the quantity stored may be *flammable liquids*.

4.2.10.3. Maximum Number of Cabinets

(1) Except as provided in Sentences (2) and (3), not more than 3 cabinets shall be located in a *fire compartment*.

(2) In *industrial occupancies*, more than 3 cabinets may be located in a *fire compartment* provided

(a) not more than 3 cabinets are grouped together in one location, and

(b) the distance between groups of cabinets in Clause (a) is not less than 30 m.

(3) In Group B *institutional occupancies*, only one cabinet shall be located in a *fire compartment*.

4.2.10.4. Marking. Cabinets for container storage shall be marked with conspicuous lettering indicating that the cabinet contains flammable materials and that open flames must be kept away. *

4.2.10.5. Construction

(1) Except as permitted in Sentence (2), storage cabinets in Article 4.2.10.1. shall be constructed to limit the internal temperature rise to not more than 139°C above ambient temperature for a period of 10 min when the entire cabinet is subjected to a temperature equal to that set forth in CAN/ULC-S101, "Standard Methods of Fire Endurance Tests of Building Construction and Materials."

(2) When permitted by the *Fire Authority*, wooden storage cabinets constructed in conformance with the following may be used in lieu of those described in Sentence (1): *

(a) the top, sides and bottom shall be constructed of an exterior grade of plywood not less than 25 mm thick,

(b) a 50 mm deep liquid-tight metal pan shall be provided at the bottom,

(c) all joints shall be rabbeted and fastened in 2 directions with flathead wood screws,

(d) when more than one door is used, there shall be a rabbeted overlap of not less than 25 mm,

(e) hinges shall be mounted so as to maintain their holding capacity due to loosening or burning-out of the screws,

(f) doors shall be provided with latches that will keep them securely closed, and

(g) be provided with liquid-tight sills beneath doors, extending not less than 50 mm above the bottom of the cabinet.

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 *drums, portable containers* and *prepackaged containers* in outdoor storage areas shall conform to Table 4.2.11.A.

* **(2)** The clearances required in Sentence (1) do not apply where a maximum of 5 000 L of *flammable liquids* and *combustible liquids* in aggregate 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 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. 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. A lane not less than 6 m wide constructed in conformance with 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. (See Appendix A.) *

4.2.11.4. Spill Control. Outdoor storage areas for *flammable liquids* or *combustible liquids* shall be designed to accommodate possible spillage in conformance with Subsection 4.1.6.

Table 4.2.11.A.

Forming Part of Sentence 4.2.11.1.(1)

Outdoor Container Storage			
Class of Liquid (1)	Maximum Total Quantity, per Pile, L	Minimum Distance Between Piles, m	Minimum Distance to a Property Line or to a *Building* on the Same Property, m
Class IA	5 000	1.5	6
Class IB or Class IC	15 000	1.5	6
Class II	35 000	1.5	6
Class IIA	85 000	1.5	6
Column 1	2	3	4

Note to Table 4.2.11.A.:

(1) Product shall be classified in accordance with Article 4.1.2.1.

Section 4.3 Tank Storage

4.3.1. Design, Construction and Use of Storage Tanks

4.3.1.1. Application. 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) CAN4-S601, "Standard for Shop Fabricated Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids,"

(b) CAN4-S603, "Standard for Steel Underground Tanks for Flammable and Combustible Liquids,"

(c) CAN4-S603.1, "Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids,"

(d) CAN4-S615, "Standard for Reinforced Plastic Underground Tanks for Petroleum Products,"

(e) CAN4-S630, "Standard for Shop Fabricated Steel Aboveground Vertical Tanks for Flammable and Combustible Liquids,"

(f) CAN/ULC-S643, "Standard for Shop Fabricated Steel Aboveground Utility Tanks for Flammable and Combustible Liquids,"

(g) API-650, "Welded Steel Tanks for Oil Storage,"

(h) API-12B, "Specification for Bolted Tanks for Storage of Production Liquids,"

(i) API-12D, "Specification for Field Welded Tanks for Storage of Production Liquids," and

(j) API-12F, "Specification for Shop Welded Tanks for Storage of Production Liquids."

* **(2)** Tanks built in conformance with the standards listed in Clauses (1)(h), (i) and (j) shall be used only for the storage of crude petroleum at oil fields.

(3) When necessary because of possible contamination of the liquid to be stored or possible 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. *

(4) *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) the Boiler and Pressure Vessel Act and regulations under that Act. *

(2) *Pressure vessels* shall be constructed in conformance with the Boiler and Pressure Vessel Act and regulations under that Act. *

(3) *Low pressure storage tanks* and *pressure vessels* may be used as *atmospheric storage tanks*.

4.3.1.4. Operating Pressure. The normal operating pressure of a *storage tank* shall not exceed its design pressure.

4.3.1.5. Corrosion Protection. 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. 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 that conforms to API-650, "Welded Steel Tanks for Oil Storage." *

4.3.2. Installation of Outside Aboveground Storage Tanks

4.3.2.1. Location

(1) Except as provided in Sentences (2) to (4), every aboveground *storage tank* for the storage of *flammable liquids* or *combustible liquids* shall be located in conformance with Table 4.3.2.A. with respect to property lines and *buildings*.

(2) The minimum required distance in Sentence (1) from a *storage tank* to a property line or to a *building* on the same property is permitted to be reduced to 1.5 m provided the *storage tank* contains only *combustible liquids* and does not exceed 50 000 L storage capacity.

(3) At bulk plant rail loading and unloading facilities, the minimum distance from a *storage tank* to a property line or to a *building* on the same property may be reduced to the limits specified in General Order 0-32, "Flammable Liquids Bulk Storage Regulations," of Transport Canada.

(4) The minimum distance from a *storage tank* to a *building* on the same property may be reduced to 0.5 m provided the tank

(a) contains only *combustible liquids*, and
(b) does not exceed 5 000 L capacity.

(5) Where end failure of horizontal *storage tanks* may endanger adjacent property, the tanks shall be placed with the longitudinal axis parallel to such property.

* **(6)** *Storage tank* spacing not conforming to the requirements of this Subsection and requiring special engineering design shall be *approved*.

Table 4.3.2.A.

Forming Part of Sentence 4.3.2.1.(1)

Location of Aboveground Storage Tanks	
Maximum Tank Capacity, L	Minimum Distance from *Storage Tank* to Property Line or to a *Building* 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
Column 1	2

4.3.2.2. Spacing Between Storage Tanks

(1) Except as required in Sentence (2) and Article 4.3.2.3., the minimum distance between aboveground *storage tanks* shall be half the diameter of the smaller of every 2 adjacent *storage tanks* where any one of the tanks has a capacity exceeding 250 000 L, but in no case shall the distance be 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.

4.3.2.3. Clearances from Liquefied Petroleum Gas Containers

(1) The minimum separation between a *flammable liquid* or *combustible liquid storage tank* and a liquefied petroleum gas container shall be 6 m. *

(2) Diked storage areas for *flammable liquids* or *combustible liquids* shall not contain liquefied petroleum gas containers, and the centre line of the dike shall be not less than 3 m away from such containers. *

4.3.2.4. Access for Fire Fighting. *Storage tanks* for *flammable liquids* or *combustible liquids* shall be spaced so that each *storage tank* is accessible for fire fighting purposes.

4.3.2.5. Testing. At the time of installation, aboveground *storage tanks* and associated piping shall be tested in conformance with Subsection 4.3.16. and 4.4.6.

4.3.2.6. Repairs

(1) No person shall repair a shop fabricated *storage tank* on site that is structurally damaged unless the repair conforms to *

(a) ULC Technical Supplement, CAN4-S601(A), "Refurbishing of Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids,"
(b) ULC Technical Supplement, CAN4-S630(A), "Refurbishing of Steel Aboveground Vertical Tanks for Flammable and Combustible Liquids," or
(c) API Standard 653, "Tank Inspection, Repair, Alteration and Reconstruction."

4.3.3. Supports, Foundations, Anchorage and Protection for Aboveground Storage Tanks

4.3.3.1. Foundations and Supports

(1) *Storage tanks* shall rest on the ground on foundations or on supports made of concrete, masonry, piling or steel in conformance with Appendix B of API-650, "Welded Steel Tanks for Oil Storage," and Appendices C and D of API-620, "Design and Construction of Large, Welded, Low-Pressure Storage Tanks."

(2) *Storage 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.** In areas subject to earthquake forces, *storage tanks*, supports and connections shall be designed to resist such forces in conformance with Part 4 of the Alberta Building Code and Appendix A of CAN4-S630, "Standard for Shop Fabricated Steel Aboveground Vertical Tanks for Flammable and Combustible Liquids."

4.3.3.3. Protection Against Flooding. 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.** An *inspector* or *local assistant* 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. *Atmospheric* and *low pressure storage tanks* shall be provided with normal and emergency venting in conformance with API-2000, "Venting Atmospheric and Low-Pressure Storage Tanks," or the tank design standards listed in Sentence 4.3.1.2.(1).

4.3.4.2. Unstable Liquids. 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. 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 *flammable liquids* shall be located

(a) outside *buildings*,
(b) not less than 3.5 m above the adjacent ground level,
(c) not less than 1.5 m from any *building* opening, and
(d) 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 *combustible liquid storage tanks* 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), two or more *storage tanks* may 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 *flammable liquids* shall not be connected to vent piping for *storage tanks* for *combustible liquids* unless an effective arrangement is provided to prevent the vapours from the *flammable liquids* from entering the other tanks.

4.3.6. Openings Other Than Vents in Aboveground Storage Tanks

4.3.6.1. Provision of Valves. 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 practical 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 may 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 *flammable liquids* shall be equipped with caps or covers.

* **(2)** Caps or covers described in Sentence (1) shall be kept closed except when the liquid level of the *storage tank* is being measured.

4.3.6.4. Connections for Filling and Emptying

* **(1)** Connections used for filling or emptying *storage tanks* shall be

(a) located outside *buildings*,
(b) at a location free of sources of ignition,
(c) not less than 1.5 m from *building* openings,
(d) identified in conformance with Sentence 4.3.11.3.(5), and
(e) kept closed when not in use.

4.3.7. Dikes and Drainage for Aboveground Storage Tanks

4.3.7.1. Spill Control. 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.

4.3.7.2. Clearances

(1) Except as provided in Sentence (2), the distance between a *storage tank* shell and the centre line of a dike shall be not less than 3 m or one-half the height of the *storage tank* above the top of the dike, whichever is greater. (See Appendix A.)

(2) For *storage tanks* having capacities not exceeding 150 000 L, the distance required in Sentence (1) need not exceed 3 m, and may be reduced to 1.5 m when permitted by the *Fire Authority*. (See Appendix A.) *

4.3.7.3. Capacity of Diked Area

(1) Where a diked area contains only one *storage tank*, the diked area shall be of sufficient size to contain a volume of liquid at least 10 per cent greater than the volume of the tank.

(2) Where a diked area contains more than one *storage tank* the diked area shall be of sufficient size to contain a volume of liquid not less than the volume of the largest tank plus 10 per cent of the aggregate volume of all the other tanks, or 10 per cent greater than the volume of the largest tank, whichever is greater.

4.3.7.4. Construction

(1) The base and walls of the dike described in Article 4.3.7.3. shall be of earth, steel, concrete, solid masonry or a compatible synthetic membrane and shall be designed, constructed and maintained to provide a maximum permeability of 1×10^{-6} cm/sec. *

(2) Openings shall not be permitted in dikes in Article 4.3.7.3., and where piping passes through the dikes, the pipe passages shall be designed, constructed and maintained to prevent seepage from the diked area.

(3) The walls of every earth dike described in Article 4.3.7.3. shall have *

(a) a flat top not less than 600 mm wide
(b) a height of not less than 600 mm, and

(c) a slope consistent with the angle of repose of the material.

4.3.7.5. Height of Dike Walls

(1) Except as provided in Sentence (2), the walls of a diked area in Article 4.3.7.3. shall not exceed an average height of 1.8 m above the ground level within the enclosing dike.

* **(2)** Dikes may exceed 1.8 m above the ground level within the enclosing dike if *accepted* provisions are made to facilitate access to the *storage tank*, valves and other equipment and safe egress from the diked area. (See also Articles 4.3.7.6. and 4.3.7.7.) (See Appendix A.)

4.3.7.6. Access

(1) Dikes in Article 4.3.7.3. shall be designed to facilitate access to *storage tanks*, valves and other equipment, and safe egress from the diked area.

(2) When either the average height of a dike containing *flammable liquids* exceeds 3.5 m, measured from the ground level of the interior of the diked area, or when the distance between any tank and the top inside edge of the dike wall is less than the height of the dike wall, provisions shall be made for the normal operation of valves and for access to *storage tank* roofs at a level above the top of the dike.

4.3.7.7. Fire Suppression Measures. When the height or location of dike walls prevents fire fighting access to *storage tanks* containing *flammable liquids* or *combustible liquids* with *flash points* below 60°C, or when the diameter of a *storage tank* exceeds 45 m, fire extinguishing measures conforming to good fire protection engineering practice shall be provided. (See Appendix A.)

4.3.7.8. Drainage

(1) Where provision is made for draining water from diked areas, drainage shall be provided in conformance with Subsection 4.1.6.

* **(2)** Controls for the drainage system shall be
(a) accessible under fire exposure conditions, and
(b) located outside the diked area.

* **(3)** 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 Diked Areas. *Drums, portable containers* and combustible material other than stiles or walkways shall not be permitted in a diked area.

4.3.8. Installation of Underground Storage Tanks

4.3.8.1. Location

(1) The location of each proposed *underground storage tank system* shall be assigned a site sensitivity classification by an *inspector* in accordance with Sentences (2) and (3). *

(2) 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.

(3) The site sensitivity classification shall be Class "B" if it does not meet the criteria for Class "A" sites described in Sentence (2).

(4) 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 (2), 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 *overfill protection device* conforming with the requirements of ULC/ORD-C58.15, "Overfill Protection Devices for Underground 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), and
(g) all *storage tank* fill pipes are equipped with liquid and vapour tight adapters and caps.

(5) 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 (3) unless
(a) the *underground storage tank system* is constructed and installed in conformance with this Part,
(b) an *overfill protection device* conforming to Clause (4)(c) is installed,
(c) a *spill containment device* conforming to Clause (4)(d) is installed,
(d) leak detection is installed (see Appendix A, A-4.3.8.1.(4)(e)),
(e) a line leak detection device is installed on pressurized or vacuum piping systems (see Appendix A, A-4.3.8.1.(4)(f)), and
(f) all *storage tank* fill pipes are equipped with liquid and vapour tight adapters and caps.

(6) An underground *storage tank* 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.

(7) An underground *storage tank* shall be located
(a) not less than 600 mm from an adjacent tank,
(b) at least 1 m from a *building* or street line, and
(c) at least 1.5 m from the other property lines.

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) 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* may be installed so that at least
(a) 75 per cent of its mass is below adjacent ground level provided there is not less than 600 mm of ground cover over the portion of the *storage tank* above adjacent ground level, or
(b) 50 per cent of its mass is below adjacent ground level provided there is not less than 1 m of ground cover over the portion of the *storage 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 the *storage tanks* are lowered into the excavation.

(2) An underground *storage tank* that is structurally 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 an excavation by the use of
(a) lifting lugs and hooks, and
(b) spreader bars, where necessary, to prevent damage to the protective coating.

(2) *Storage tanks* shall not be lowered into an excavation by any method that might result in damage to the protective coating of the tank.

4.3.8.5. Installation

(1) Underground steel *storage tanks* shall be installed in conformance with Appendix B of CAN4-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, "Standard for Reinforced Plastic Underground Tanks for Petroleum Products."

4.3.8.6. Testing. At the time of installation, an *underground storage tank system* shall be tested in conformance with Subsections 4.3.16. and 4.4.6.

4.3.8.7. Filling. *Flammable liquids* or *combustible liquids* shall not be placed in an underground *storage tank* until the fill pipe and vent line have been installed in the tank and all other openings have been sealed.

* **4.3.8.8. Spillage.** If a spill occurs, the escaped liquid and all soil contaminated by the spill shall be removed in conformance with Subsection 4.1.9.

4.3.8.9. Anchorage

* **(1)** Where a high water table is anticipated, underground *storage tanks* shall be anchored against uplift forces. (See Appendix A.)

(2) The anchorage required in Sentence (1) shall be designed to resist uplift due to hydrostatic forces when the *storage tank* is empty.

(3) Anchors and ground straps used to resist uplift forces shall be electrically isolated from the *storage tank*, and shall be installed in such a manner that they do not damage the protective coating on the *storage 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 fittings subject to corrosion shall be protected in conformance with CAN4-S603.1, "Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids."

(2) Steel *storage tanks* not conforming to CAN4-S603.1, "Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids," shall have corrosion protection conforming to good engineering practice based upon tests and the corrosion history of the area. (See Appendix A.)

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 CAN4-S603M, "Standard for 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.** Underground *storage tanks* shall have vent openings and piping with cross-sectional areas sufficient to vent the tanks during the maximum filling or withdrawal rate without causing the allowable stress for the tanks to be exceeded.

4.3.10.2. Materials and Construction. 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 *flammable liquids* shall be located

(a) outside *buildings*,
(b) higher than the fill pipe openings,
(c) not less than 3.5 m above the adjacent ground level,
(d) not less than 1.5 m from any *building* opening,
(e) not less than 7.5 m from any dispensing unit, and
(f) so that any discharge of flammable vapours from the vent pipe will not enter *building* openings or be trapped near any part of the *building*.

(2) Vent pipe outlets from underground *storage tanks* for *combustible liquids* shall be located

(a) outside *buildings*,
(b) above the fill pipe opening, and
(c) not less than 2 m above finished ground level.

* **(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 *combustible liquids* may be fitted with return bends, coarse screens or other devices designed 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 or vent check.

(5) Vent piping shall be installed and maintained so that

(a) any nominally horizontal run slopes towards the *storage tank*,
(b) there are no traps,
(c) there is sufficient support to prevent sagging, and
(d) protection against mechanical damage is provided where necessary.

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 sufficient 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* in Sentence (1) simultaneously, or where the connected vents have a vapour recovery system, the vent piping shall be sufficient to accommodate the maximum vapour flow possible in the system.

(3) Vent piping for an underground *storage tank* containing a *flammable liquid* shall not be connected to the vent piping for a *storage tank* containing a *combustible liquid* unless an effective method is provided to prevent the vapours from the *flammable liquids storage tank* from entering the other tank.

4.3.11. Openings Other than Vents in Underground Storage Tanks

4.3.11.1. Connections. Connections for all openings in underground *storage tanks* shall be liquid and vapour tight.

4.3.11.2. Openings for Measuring Liquid Level. 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 Article 4.3.19.1., connections used for filling or emptying *storage tanks* for *flammable liquids* or *combustible liquids* shall be located
  (a) outside *buildings*,
  (b) at a location free of sources of ignition, and
  (c) not less than 1.5 m from any *building* openings.

(4) Connections for filling or emptying *storage tanks* in Sentence (3) shall be kept closed to prevent leakage when not in use.

* **(5)** Connections for filling or emptying *storage tanks* in Sentence (3) shall be identified in conformance with CPPI, "Recommended Practice for Product Identification at Service Stations and Distribution Terminals."

4.3.12. Installation of Storage Tanks Inside Buildings

4.3.12.1. Occupancy

(1) Except as provided in Articles 4.3.12.2. and 4.3.12.3., *storage tanks* shall not be permitted in other than *industrial occupancies*.

* **(2)** Rooms and *floor areas* used for storage of *flammable liquids* or *combustible 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.)

4.3.12.2. Oil Burning Equipment. *Storage tanks* for *combustible liquids* used as a fuel supply for stationary engines shall be installed in conformance with the requirements of CAN/CSA B139, "Installation Code for Oil Burning Equipment," for supply tanks installed inside *buildings*.

4.3.12.3. Stationary Combustion Engines

(1) Except as permitted in Sentence (2), installations using *flammable liquids* as fuel supplies for stationary engines inside *buildings* shall conform to NFPA 37, "Installation and Use of Stationary Combustion Engines and Gas Turbines."

(2) In *buildings* which contain only stationary engines and associated generating or pumping equipment, *flammable liquids* may be used as fuel supplies provided the installation conforms to this Part.

4.3.12.4. Maximum Quantities and Location

(1) Except as provided in Subsection 4.2.8., and in Article 4.3.12.7., *storage tanks* for *flammable liquids* or *combustible liquids* shall be
  (a) located in dedicated rooms conforming to Subsection 4.3.13., and
  (b) located in conformance with Table 4.3.12.A.

(2) When quantities exceeding the amount 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 conforming to Subsection 4.3.13., provided that
  (a) total quantities are not more than one-half the quantities permitted in Table 4.3.12.A.,
  (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 4.3.13.3.

(3) Quantities permitted in Sentence (2) to be outside of a storage room shall be included in the total quantity allowed per *storey* in Table 4.3.12.A.

4.3.12.5. Maximum Static Head. The static head imposed on a *storage tank* inside a *building* shall not exceed 70 kPa (gauge) at the bottom when the vent or fill pipe is filled with liquid unless the *storage tank* is designed for greater pressures.

4.3.12.6. Mixed Storage. When two or more classes of liquids are stored in a single *storey*, the total quantity permitted for each class of liquid shall be calculated as follows

$$\frac{q_I}{Q_I} + \frac{q_{II}}{Q_{II}} + \frac{q_{IIIA}}{Q_{IIIA}} \leq 1$$

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,

Q_I = the maximum quantity of Class I liquid permitted in Table 4.3.12.A.,

Q_{II} = the maximum quantity of Class II liquid permitted in Table 4.3.12.A.,

Q_{IIIA} = the maximum quantity of Class IIIA liquid permitted in Table 4.3.12.A.

Table 4.3.12.A.

Forming Part of Article 4.3.12.4.

Tank Storage of Flammable Liquids and Combustible Liquids in Rooms			
Class of Liquid	Location of Dedicated Room	Maximum Quantity per *Storey* (2),L One or More Tanks	
		Protected(1) Storage	Unprotected Storage
CLASS I (*Flash point* below 37.8°C)	*First storey*	40 000	25 000
	Storeys above the *first storey*	7 500	Not Permitted
	Basement	Not Permitted	Not Permitted
CLASS II and IIIA (*Flash point* at or above 37.8°C and below 93.3°C)	*First storey*	200 000	100 000
	Storeys above the *first storey*	20 000	Not Permitted
	Basement	20 000	Not Permitted
Column 1	2	3	4

Notes to Table 4.3.12.A.:
(1) See Article 4.2.7.7. for guidance on acceptable protection.
(2) See Article 4.3.13.1.

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 per cent 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) Subsection 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. 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. 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. 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, so that all parts of the room are within reach of a hose stream. (See Appendix A.)

(2) Portable extinguishers for Class B hazard shall be provided in conformance with Part 6.

4.3.13.4. Placards

(1) Where *flammable liquids* or *combustible liquids* in *storage tanks*, are stored in rooms, a placard conforming to Article 3.3.6.14. shall be posted which

(a) identifies the liquid stored, and

(b) states the capacity of each tank.

(2) The placard required by Sentence (1) shall be in a conspicuous location outside each room.

(3) The information specified in Sentence (1) shall be included in the fire safety plan required by Article 4.1.5.7.

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 practical 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 *flammable liquids* and *combustible liquids* with flash points below 60°C shall * *

(a) be equipped with a vapour-tight cap, and

(b) be opened only when measuring the liquid level.

(2) Openings in Sentence (1) shall be protected against overflow and *vapour pressure* by means of a spring-loaded check valve.

4.3.14.3. Fill Pipes

(1) Where a *storage tank* is located in a *building* and the tank is used for the storage of *flammable liquids* with a *flash point* below 22.8°C the fill pipe of the tank shall terminate within 150 mm of the bottom of the *storage tank*. * *

(2) Fill pipes for *storage tanks* in *buildings* shall be installed so as to minimize vibration of the pipe. *

4.3.14.4. Overflow Protection. *Storage tanks* in *buildings* shall be equipped with devices that will prevent overflow. (See Appendix A.) *

4.3.15. Identification of Aboveground Storage Tanks

* 4.3.15.1. Identification

(1) 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.

(2) Signs installed in accordance with Sentence (1) shall be located on at least two sides of a *storage tank*.

4.3.16. Leakage Testing of Storage Tanks

4.3.16.1. 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 4.3.17.2.

(See Appendix A.)

* **(2)** Except as provided in Sentence (3), where liquid level measurements in Subsection 4.3.17. 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 *storage tank* construction standards in Articles 4.3.1.2. and 4.3.1.3., such tests shall be permitted for tanks conforming to those standards.

4.3.16.2. Retention of Records

* **(1)** Records of tests in Article 4.3.16.1. shall be retained for examination by an *inspector* or *local assistant*, in accordance with Article 1.1.5.1.

* **(2)** When records of tests referred to in Sentence (1) are requested by an *inspector* or *local assistant* the records shall be produced for examination within 72 h.

4.3.16.3. Remedial Action

(1) If a leak is detected in a *storage tank* during the leakage test referred to in Article 4.3.16.1.

(a) an underground *storage tank* shall be replaced,
(b) an aboveground *storage tank* shall be repaired or replaced, and
(c) any liquid that has escaped shall be removed in conformance with Subsection 4.1.9.

4.3.16.4. Pneumatic Leakage Tests

(1) Pneumatic leakage tests shall not be performed on a field-erected aboveground *storage tank*.

(2) Pneumatic leakage tests shall not be performed on a *storage tank* with *flammable liquid* or *combustible liquid* in the tank.

(3) Where a pneumatic leakage test is performed on an underground *storage tank*, the tank shall be considered to be leaking when any pressure drop is detected 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 an underground *storage tank* shall be measured by an instrument calibrated in increments of not more than 1 kPa.

(5) Where a pneumatic leakage test is conducted before a *storage tank* is backfilled in the case of a new tank, or after the *storage 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) CAN4-S603, "Standard for Steel Underground Tanks for Flammable and Combustible Liquids," or
(b) CAN4-S615, "Standard for Reinforced Plastic Underground Tanks for Petroleum Products."

(6) 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 *storage tank* that has been in use.

4.3.16.5. 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).

4.3.17. Liquid Level Measurements

* 4.3.17.1. Liquid Level Measurements

(1) The product level and the level of water at the bottom of an underground *storage tank* shall be measured

(a) each day product is added or removed from the tank, or

(b) at least weekly if product is added or removed less frequently than once per week.

(2) The product level and the level of water at the bottom of an aboveground *storage tank* shall be measured at least weekly.

(3) A record for each *storage tank* shall be maintained and included with a monthly summary of cumulative losses or gains of the product being stored, showing

(a) the measurements described in Sentences (1) and (2),

(b) a comparison of the measurements with meter readings, shipments, or internal transfers, and

(c) the computation of any gain or loss in quantity of the product stored in each *storage tank.*

(4) 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 Sentence (3).

(5) The records referred to in Sentences (3) and (4) shall be the subject of an *accepted* audit 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 an *inspector* or *local assistant* in accordance with Article 1.1.5.1.

(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.

4.3.17.2. Notification *

(1) The *owner* of a *storage tank* shall immediately notify an *inspector* or *local assistant* in the event of a spill of more than 100 L in accordance with Sentence 4.1.9.1.(4) 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 4.3.17.1.(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 Appendix A- 4.3.16.1.(1)),

(f) failure of a hydrostatic piping test which indicates a pressure drop of more than 34 kPa (gauge) per minute,

(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 an *inspector* or *local assistant* 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.

* 4.3.18. Upgrading of Existing Underground Storage Tank Systems

4.3.18.1. Application. 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.

4.3.18.2. General. No person shall alter or install an *underground storage tank system* unless approvals have been obtained in conformance with Article 4.1.1.2.

4.3.18.3. 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 4.3.18.A.

(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 4.3.18.B.

(4) *Underground storage tank systems* identified in Sentences (1) and (2) may be upgraded at the time specified in Tables 4.3.18.A. and B., 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) *overfill protection devices* in accordance with Clause 4.3.8.1.(4)(c),

(c) *spill containment devices* in accordance with Clause 4.3.8.1.(4)(d),

(d) leak detection in accordance with Clause 4.3.8.1.(4)(e),

(e) line leak detection on pressurized or suction piping systems in accordance with Clause 4.3.8.1.(5)(e), and

(f) liquid and vapour tight adapters and caps.

Table 4.3.18.A.

Forming Part of Sentence 4.3.18.3.(2)

Storage Tank Systems Upgrading Schedule All Class "A" Sites	
Age of tank system in years from date or orginal installation	Remove, replace or upgrade in conformance with Article 4.3.18.3.
25 and greater or unknown* 15-24 5-14 0-4	2 years 3 years 4 years 5 years
Column 1	2

* (See Appendix A-4.3.18.3.(2).)

Table 4.3.18.B.

Forming Part of Sentence 4.3.18.3.(3)

Storage Tank Systems Upgrading Schedule All Class "B" Sites	
Age of tank system in years from date of orginal installation	Remove, replace or upgrade in conformance with Article 4.3.18.3.
25 and greater or unknown* 15-24 5-14 0-4	4 years 5 years 6 years 7 years
Column 1	2

* (See Appendix A-4.3.18.3.(2).)

4.3.19. Used Oil

4.3.19.1. Storage and Handling

(1) Except as provided in Sentences (2) and (3), the storage and handling of *used oil* shall conform to the appropriate requirements for the storage and handling of *flammable liquids* contained in this Part. (See Appendix A.)

(2) A pipe to convey *used 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.*

* **(3)** Unless *accepted,* no person shall store more than 2 500 L of *used oil* aboveground at a *service station.*

* **(4)** *Used oil* stored in accordance with Sentence (3) shall be more than 15 m from a *building,* or an area of the property where the public has access.

* **(5)** *Used oil storage tanks* shall be equipped with removable suction tubes with leak-tight couplings. (See Appendix A.)

* **(6)** *Used oil storage tanks* located outside *buildings* are exempt from the requirements for overfill prevention.

Section 4.4 Piping and Transfer Systems

4.4.1. Application

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

(a) tubing or casings and piping for oil or gas wells,
(b) piping for vehicles, aircraft, watercraft and portable or stationary engines,
(c) piping systems in *service stations* and *distilleries,*
(d) piping systems on piers and wharves, and
* (e) piping within the scope of the Boilers and Pressure Vessels 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), materials for piping systems in Sentence (1) shall not be permitted if the material is

(a) subject to failure from internal stress, or
(b) combustible or low-melting-point material that is subject to failure in moderate fires.

(3) Piping systems conforming to ULC-C107C, "Guide for Glass Fibre Reinforced Plastic Pipe and Fittings for Flammable Liquids," may be used for underground installations.

(4) Except as provided in Sentence (5), where steel piping, including welded and seamless grades, is used, it shall meet the requirements of

(a) API-5L, "Specification for Line Pipe,"
(b) ASTM A53, "Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless," or
(c) CAN/CSA Z245.1-M, "Steel Line Pipe."

(5) Where service pressures exceeding 875 kPa (gauge) may occur, piping and fittings shall be designed in conformance with ASME/ANSI B31.3, "Chemical Plant and Petroleum Refinery Piping."

4.4.2.2. Special Materials. Where problems * of corrosion, contamination, sanitation or standards of purity require special materials, materials other than metallic that are compatible with the product, may be used for piping, valves and fittings.

4.4.3. Corrosion Protection of Piping Systems

4.4.3.1. Corrosion Protection *

(1) All exposed and underground piping, couplings, flanges and bolts for *flammable liquids* and *combustible liquids* shall be protected where necessary against external corrosion.

* **(2)** All steel vent pipes, including galvanized steel pipes, shall be cathodically protected from corrosion in conformance with Subsection 4.3.9. (See Appendix A.)

4.4.4. Identification of Piping Systems

4.4.4.1. Identification

(1) Pipelines for *flammable liquids* or *combustible liquids* shall be marked in conformance with Sentence 4.3.11.3.(5) to indicate the contents of the line.

* **(2)** Markings required by Sentence (1) shall be kept clearly legible at all times.

(3) Piping for *flammable liquids* or *combustible liquids* shall not be painted red.

4.4.4.2. Plans

(1) Plans showing piping systems for *flammable liquids* or *combustible liquids*, including *storage tank* and pumping arrangements, shall be available to the fire department on request.

(2) Sets of plans described in Sentence (1) shall be kept at 2 separate locations.

4.4.5. Joints in Piping Systems

4.4.5.1. Threaded Joints. Threaded joints in piping systems for *flammable liquids* and *combustible liquids* shall be made using joint compound or polytetrafluoroethylene tape conforming to CAN/ULC-S642, "Standard for 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 Part 5 and with provincial regulations or, in the absence of such regulations, with the appropriate requirements of

(a) API-1104, "Standard for Welding Pipelines and Related Facilities," or

(b) API RP1107, "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 B16.5, "Pipe Flanges and Flanged Fittings, Steel Nickel Alloy and Other Special Alloys."

(2) Bronze flanges for 50 mm or smaller size piping in Article 4.4.5.2. may be used where copper and brass piping is permitted.

4.4.5.4. Bolting Materials. Bolting materials for flanged connections in steel piping systems for *flammable liquids* or *combustible liquids* shall be of alloy steel equivalent to ASTM A193/193M, "Alloy-Steel and Stainless Steel Bolting Materials for High Temperature Service," Grade B-7.

4.4.5.5. Gaskets. 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) Except as provided in Sentence (2), piping * systems including those at *service stations*, shall be tested for leakage before backfilling at the time of installation and whenever a leak is suspected.

(2) Exposed piping systems in service may be visually inspected for leakage in conformance with Article 4.4.11.3.

(3) When exposed piping systems are subjected to a pneumatic leakage test, the piping, including the joints, shall be soaped to assist in the detection of leaks.

4.4.6.2. Retention of Records

(1) Records of the pressure tests on piping * systems shall be retained for examination by an *inspector* or *local assistant*.

(2) When records of tests referred to in * Sentence (1) are requested by an *inspector* or *local assistant*, the records shall be produced for examination within 72 h.

4.4.6.3. Remedial Action. 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 4.1.9.

4.4.6.4. Failure Criteria. Piping systems shall be considered to be leaking when any pressure drop or volume loss is detected within a 2 h period after steady temperature conditions have been established and the source of pressure has been removed.

4.4.6.5. Test Equipment. Pressure measurements in Article 4.4.6.1. shall be obtained by using instruments calibrated in increments of not more than 4 kPa for test pressures up to 700 kPa (gauge) and in increments of not more than 1 per cent of the test pressure where it exceeds 700 kPa (gauge).

4.4.6.6. Test Pressures

(1) Except as provided in Sentences (2) and (3) and Article 4.4.6.7., piping systems shall be pressure tested at pressures of not less than 350 kPa (gauge) or 1.5 times the maximum operating pressure, whichever is the greater.

(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.

4.4.6.7. Flammable Liquids as a Test Medium. *Flammable liquids* shall not be used for pressure testing piping systems, except that pressure lines normally containing *flammable liquids* may be tested with such liquids at pressures not exceeding their maximum operating pressures.

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 pipe shall follow as direct and as short a route 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 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 permitted to be located on the exterior of walls except on those of *noncombustible construction*, and in no case shall such piping be located above windows.

(2) Aboveground outdoor piping located above roofs shall not be permitted except above roofs of *noncombustible* and impermeable *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 dike 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 General Order No. E-10, "Pipe Crossings Under Railways (No.E-10) Regulations," issued by Transport Canada.

(4) Piping adjacent to railway tracks shall be installed in conformance with General Order No. 0-32, "Flammable Liquids Bulk Storage Regulations," issued by Transport Canada.

4.4.7.5. Installation of Underground Piping

(1) Underground piping shall be supported on undisturbed or compacted soil and shall be backfilled on the top and sides with not less than 300 mm of pea gravel or clean crushed stone or not less than 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. 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 shutoff 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, trapped drains conforming to Subsection 4.1.6. shall be provided.

(2) When piping referred to in Sentence (1) contains *flammable liquids*, the trench shall be provided with positive ventilation to the outdoors or shall be 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 so that the piping is not less than 1.8 m above the floor.

(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 *approved* 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. Exposed pipe risers shall be protected against mechanical damage by installing such risers adjacent to walls or pilasters, between flanges of steel columns or within securely anchored larger perforated pipe, and by 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, "Standard for Flexible Underground Hose Connectors for Flammable and Combustible Liquids," may 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, "Guide for the Investigation of Valves for Flammable and Combustible Liquids."

(2) Hose nozzle valves shall conform to CAN/ULC-S620M, "Standard for Hose Nozzle Valves for Flammable and Combustible Liquids."

(3) Emergency valves shall conform to CAN/ULC-S651-M, "Standard for Emergency Valves for Flammable and Combustible Liquids."

4.4.8.2. Shutoff Valves

(1) Shutoff 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 shutoff 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 conforming to Article 4.4.8.1. may be used when special conditions warrant their use.

4.4.8.3. Diaphragm Valves. Diaphragm valves shall have no direct connections between the liquid and air section that might permit leakage of the liquid past the packing into the air lines.

4.4.8.4. Globe Valves. Globe valves shall be arranged so that the packing is on the low pressure side.

4.4.8.5. Indicating Valves. 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. Where cast iron meters are used, they shall be isolated by the use of steel valves.

4.4.8.7. Identification

(1) All aboveground valves shall be identified in conformance with Sentence 4.3.11.3.(5). *

(2) Identification tags required in Sentence (1) shall be of enamelled metal, anodized aluminum, pressed fibre or solvent resistant plastic.

(3) Identification tags shall indicate the name of the product in clear, legible, permanent characters.

(4) Every identification tag shall be kept clean.

4.4.9. Heating of Piping Systems

4.4.9.1. Design. 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 may be heated by steam lines provided the minimum steam temperature and pressure to make the liquid fluid are used and the provisions of Sentences (2) and (3) are met. *

(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 requirements of the Alberta Building Code. *

4.4.9.3. Electrical Heating Cables. 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) may 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 con-

form 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. No person shall use an open flame to heat *flammable liquid* or *combustible liquid* piping.

4.4.10. Methods of Transfer in Piping Systems

4.4.10.1. Location of Outdoor Pumps. Pumps used in *flammable liquid* or *combustible liquid* piping systems that are 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 the requirements of 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. Pumps for piping systems shall be provided with duplicate control switches to shutdown 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 Clause 4.3.1.3.(1)(b).

(3) Hydraulic transfer systems referred to in Sentence (1) shall be designed to prevent water pressure in excess of the design pressure of the *storage 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, *flammable liquids* or *combustible liquids* 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 inert gas, all *pressure vessels* involved shall be constructed, installed and tested in conformance with Clause 4.3.1.3.(1)(b).

(2) Pressure regulators for inert gas transfer systems 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.** No person shall transfer *flammable liquids* or *combustible liquids* in a closed piping system by means of compressed air or other non-inert gas pressure.

4.4.11. Operating Procedures for Piping Systems

4.4.11.1. Employee Training

* **(1)** Employees conducting transfer operations involving *flammable liquids* or *combustible liquids* shall be given instructions in the fire hazards and emergency procedures outlined in Sentences (1) to (7).

(2) Standard procedures for normal operation as well as for emergencies shall be given to operators and posted in printed form for convenient reference.

(3) All employees shall be instructed in the importance of constant attendance during all loading or unloading operations.

(4) Employees engaged in the operation of equipment for the transfer of *flammable liquids* or *combustible liquids* shall be instructed on the location, function and operation of valves used for the operation of fire protection equipment and manual emergency shutoff valves.

(5) Signs indicating the location of the valves described in Sentence (4) shall be posted in conspicuous locations.

* **(6)** Employees referred to in Sentence (1) shall be trained in procedures for extinguishing fires involving *flammable liquids* and *combustible liquids.*

(7) Employees shall be instructed in the *flammable liquid* and *combustible liquid* colour coding and identification system required in Article 4.4.8.7.

4.4.11.2. Portable Extinguishers.

One 80-BC rated portable extinguisher or two 40-BC units shall be provided in the vicinity of pumps and ancillary equipment used for the transfer of *flammable liquids* or *combustible liquids.*

4.4.11.3. 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 for leaks shall be made for each day of operation of all aboveground piping systems, pumps and other ancillary equipment. *

(3) Any leaks detected during the inspection required in Sentence (2) shall be repaired without delay. *

(4) Where necessary, flammable vapour indicators shall be used to detect leakage.

(5) Open flames and spark-producing devices shall not be used for leak detection referred to in Sentence (1).

4.4.11.4. Operational Tests *

(1) Monthly inspections and tests shall be made of all safety shutoff 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 1.1.5.1.

4.4.11.5. 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 whenever possible. *

Fire Prevention Act

ALBERTA FIRE CODE 1992 AMENDMENT

1 *The Alberta Fire Code 1992, as declared in force by the Alberta Fire Code Regulation, 1992 (Alta. Reg. 204/92) is amended by adding the following after Article 1.1.4.2.*

1.1.4.3. Interpretations

(1) Any person may apply to the Senior Technical Officer, Fire Standards, for an interpretation of a specific requirement of this Code and the application shall

(a) give the specific Code reference; and

(b) include a statement identifying the ambiguity or lack of clarity that requires an interpretation.

(2) After the Senior Technical Officer, Fire Standards, has reviewed the application submitted pursuant to Sentence (1) he may issue an interpretation.

(3) If the Senior Technical Officer, Fire Standards, is of the opinion that an interpretation is applicable throughout Alberta he may issue that interpretation and it shall apply in all municipalities.

1.1.4.4. Rulings

(1) Any person who is of the opinion that situations, materials, systems, equipment and procedures provides or will provide the performance intended by this Code, may apply to the Senior Technical Officer, Fire Standards, for a ruling on the acceptability of the situations, materials, systems, equipment and procedures in meeting the performance intended by this Code and shall submit sufficient evidence, as required by the Senior Technical Officer, Fire Standards, for a ruling to be made.

(2) After the Senior Technical Officer, Fire Standards, has reviewed the evidence referred to in Sentence (1) he may issue a ruling, which may contain conditions, that in his opinion the performance intended by the Code is or is not met.

(3) If it is the opinion of the Senior Technical Officer, Fire Standards, that a ruling made pursuant to Sentence (2) is applicable to more than one situation, he may make the ruling apply to more than one situation or in more than one municipality.

Fire Prevention Act

ALBERTA FIRE CODE 1992 AMENDMENT

1 *The Alberta Fire Code 1992, as declared in force by the Alberta Fire Code Regulation, 1992 (Alta. Reg. 204/92) is amended by this Regulation.*

2 *Article 1.2.1.3. is amended by inserting,*

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

3 *Article 5.2.2.3. is amended,*

in Sentence (1) by striking out "No person shall discharge" *and substituting* "Except as permitted in Clause 5.2.2.9.(1)(b), no person shall discharge, fire or set off"

4 *Article 5.2.2.8. is amended,*

in Sentence (1) by striking out "or local assistant" *and substituting* ", local assistant or forest officer in the forest protection area,"

in Sentence (2) by striking out "or local assistant" *and substituting* ", local assistant or forest officer in the forest protection area,"

in Sentence (3) by striking out "or local assistant" *and substituting* ", local assistant or forest officer in the forest protection area,"

5 *Article 5.2.2.9. is amended,*

by striking out Sentence (1) and substituting the following,

(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 *local assistant,* 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.*

in Sentence (2), Clause (b) by inserting "or forest officer" *after "local assistant."*

in Sentence (5) by inserting "or forest officer" *after "local assistant."*

Fire Code exemptions

4 Where an underground storage tank system is required to be removed, replaced or upgraded in accordance with Article 4.3.18.3 of the *Alberta Fire Code, 1992* before September 1, 1996, the deadline for compliance with that provision is extended to June 30, 1997 if the owner of the underground storage tank system submits to the Petroleum Tank Management Association of Alberta

(a) an application that is completed to the satisfaction of the Association and includes

(i) the name, business address and owner number of the owner of the site where the underground storage tank system is located,

(ii) the legal description or municipal address and the site number of the site where the underground storage tank system is located,

(iii) the number of non-complying underground storage tanks within the underground storage tank system for which the application is being made,

(iv) the reason for the need to extend the deadline referred to in Article 4.3.18.3 of the *Alberta Fire Code, 1992*,

(v) copies of bid and tender documents for the removal, replacement or upgrading of the underground storage tank system from a contractor approved to do tank removals or installations in Alberta, and

(vi) the date by which the contractor will complete the work,

(b) the appropriate fee, and

(c) an affidavit of the owner of the underground storage tank system attesting that

(i) no substance is being released from the underground storage tank system, and

(ii) other than non-compliance with Article 4.3.18.3 of the *Alberta Fire Code, 1992*, the underground storage tank system complies with that Code.

(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 engineering practice such as those described in

(a) API RP 1107, "Recommended Pipeline Maintenance Welding Practices,"

(b) API Petroleum Safety Data No. 2200, "Repairs to Crude Oil, Liquefied Petroleum Gas and Products Pipelines," or

(c) API Publication No. 2201, "Procedures for Welding or Hot Tapping on Equipment Containing Flammables."

Section 4.5 Service Stations

4.5.1. Application

4.5.1.1. Application. This Section applies to the storage, handling and use of *flammable liquids* and *combustible liquids* at *service stations*.

4.5.2. Storage and Handling

4.5.2.1. Storage Capacity

(1) The storage capacity for *flammable liquids* at *service stations* shall not exceed 250 000 L.

* **(2)** The storage capacity for *combustible liquids* at *service stations* shall not exceed 250 000 L.

(3) Individual underground *storage tanks* at *service stations* shall not exceed 50 000 L.

(4) Except as permitted in Sentence 4.3.19.1.(3), the aboveground storage of *flammable liquids* and *combustible liquids* at a *service station* shall be limited to not more than 250 L of *flammable liquid* and 2 500 L of *combustible liquid* with a *flash point* below 60°C if the liquids are stored less than 15 m from

(a) a *building*, or

(b) an area of the property where the public has access.

4.5.2.2. Flammable Liquids in Buildings

(1) Except as provided in Sentence (3), *flammable liquids* shall not be stored or handled within a *service station* unless the *building* meets the requirements of an inside storage room as stipulated in Subsection 4.2.9.

(2) *Flammable 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) Pumping equipment used inside a *service station* to transfer *flammable liquid* to or from the fuel tanks of vehicles shall be *approved*. *

(4) The location of facilities for the dispensing of gasoline shall conform to the appropriate requirements of Subsection 3.3.5. of the Alberta Building Code. *

4.5.2.3. Storage Tanks in Buildings

(1) Where *combustible liquids* with *flash points* above 60°C 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 Service Stations. The dispensing area at *marine service stations* shall be at a location which will permit safe access by vehicles, watercraft or aircraft. *

4.5.2.5. Containers

(1) All packaged *flammable liquid* and *combustible liquid* products stored above ground shall be in closed metal containers or in other containers conforming to this Part, distinctly marked with the generic name of the container contents.

(2) Where *flammable liquids* or *combustible liquids* are sold in containers, such containers shall be

(a) *prepackaged containers* that are clearly marked with the name of the liquid they contain,
(b) shipping containers conforming to Article 4.2.3.1., securely closed to prevent leaks or spills and clearly marked with the name of the liquid they contain, or
(c) *portable containers* meeting the requirements of Clause 4.2.3.1.(1)(b).

(3) Every container, including a *drum*, at a *service station* used for dispensing *flammable liquids* or *combustible liquids* shall be kept tightly closed when disconnected from its pumping apparatus.

(4) Every container referred to in Sentence (3) that is equipped with a pump shall have a vapour-tight connection between the pump and the container or *drum*.

4.5.2.6. Empty Containers. 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.(3).

4.5.2.7. Filling of Containers. *Portable containers* and *drums* shall not be filled beyond their safe filling level.

4.5.2.8. Piping

(1) Except as provided in Sentence (2), all piping associated with *flammable liquid* or *combustible liquid storage tanks* shall be made of steel and shall conform to API-5L, "Specification for Line Pipe," ASTM A53, "Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless," or CAN/CSA-Z245.1-M, "Steel Line Pipe."

(2) Non-metallic piping systems conforming to ULC-C107C, "Guide for Glass Fibre Reinforced Plastic Pipe and Fittings for Flammable Liquids," may be used for underground installations.

4.5.2.9. Corrosion Protection for Piping

(1) Except as permitted in Sentence (2), steel piping at *service stations* shall be provided with corrosion protection in conformance with CAN4-S603.1, "Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids."

(2) Piping protection not conforming to Sentence (1) may be installed provided it conforms to good engineering practice based on tests and the corrosion history of the area. (See Appendix A.)

4.5.2.10. Piping Supports and Guards. Piping shall be firmly supported and protected by installing guards when necessary to prevent vehicle impact or other mechanical damage.

4.5.2.11. Pits. Pits for subsurface pumps or for piping connected to submersed pumps shall conform to Article 4.4.10.3.

4.5.3. Dispensing Systems

4.5.3.1. Dispensing Equipment

(1) Except as provided in Sentence (2), fixed dispensing equipment for *flammable liquids* or *combustible liquids* shall conform to CSA-B346, "Power-Operated Dispensing Devices for Flammable Liquids."

(2) Where flow rates from dispensing equipment conforming to CSA-B346, "Power-Operated Dispensing Devices for Flammable Liquids," are not adequate for the intended application, other *approved* dispensing equipment may be used.

4.5.3.2. Location

(1) Fixed equipment for dispensing *flammable liquids* shall be installed outside *buildings* and not less than
(a) 3 m from any right-of-way,
(b) 3 m from any property line,
(c) 7.5 m measured horizontally from any open flame,
(d) 7.5 m from other ignition sources, except for electrical installations conforming to Article 4.1.4.1., and
(e) 4.5 m from *building* openings, except those openings in *buildings* for the shelter of operating personnel in which electrical installations conform to Article 4.1.4.1.

(2) Fixed equipment for dispensing *combustible liquids* is permitted to be installed inside *buildings* when
(a) such *buildings* are not open to the public, and
(b) *accepted* measures are taken to ensure proper safety. (See Appendix A.)

* **4.5.3.3. Protection Against Collision Damage**

(1) Fixed dispensing equipment shall be protected against collision damage by

(a) a concrete island not less than 100 mm high, or

(b) other *accepted* means.

4.5.4. Shutoff Devices

4.5.4.1. Location and Identification

(1) Devices to shut off the power to all dispensing units shall be provided at a location remote from the dispensing units or shielded from any fire that might occur at the dispensing units.

(2) The shutoff devices required in Sentence (1) shall be clearly identified and easily accessible.

4.5.4.2. Emergency Shutoff Devices

(1) Except as provided in Sentence (2), an emergency shutoff switch to stop all dispensing units at *self-service outlets* shall be located at the central 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 shutoff switch required in Sentence (1) shall be in an *accepted* location that is readily accessible to the customer.

* **(3)** Emergency shutoff switches required by Sentences (1) and (2) shall only have a manual reset capability.

4.5.4.3. Marine Service Stations. At *marine service 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-S612M, "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 *service 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 service stations* or at card or key activated dispensing units, the length of extended hose may exceed the values in Sentences (2) and (3).

4.5.5.2. Hose Nozzle Valves

(1) Where a *flammable liquid* or *combustible liquid* with a *flash point* below 60°C is dispensed into motor vehicle fuel tanks by means of a motorized dispensing unit, hose nozzle valves attached to the dispensing unit shall conform to CAN/ULC-S620M, "Standard for Hose Nozzle Valves for Flammable and Combustible Liquids," and shall be constructed so that the valve *

(a) can be kept open only by the continuous application of manual pressure, or

(b) is equipped with a device at the nozzle which will

(i) allow automatic dispensing,

(ii) automatically shut off when the fuel tank is filled, and

(iii) shut off if the nozzle is dropped or falls from the fuel tank fill pipe.

(2) Dispensing nozzles at *marine service stations* shall be of the automatic closing type without a hold-open device and shall conform to CAN/ULC-S620M, "Standard for Hose Nozzle Valves for Flammable and Combustible Liquids." *

4.5.6. Remote Pumping Systems

4.5.6.1. Application. 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 dispensing units by pumps located elsewhere than at the dispensing units.

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, "Standard for Emergency Valves for Flammable and Combustible Liquids," and incorporating a fusible element having a maximum temperature rating of 71°C shall be installed in the supply line with the shear point of the valve

(a) no higher than the base of the dispensing unit, and

(b) no more than 25 mm below the base of the dispensing unit.

(2) Emergency valves required in Sentence (1) shall close automatically in the event of severe impact or fire exposure of the dispensing unit.

(3) The emergency valve required in Sentence (1) shall be maintained in operating condition and serviced at least every 12 months.

4.5.6.4. Pump Location

(1) Pumps installed aboveground and outside *buildings* shall be located not less than 3 m from any property line and 1.5 m from any *building* opening.

(2) When an outside pump location is impractical, pumps may be installed inside *buildings* as provided in Article 4.5.2.2. or in pits as provided in Article 4.5.2.11.

4.5.6.5. Leakage Testing. After the completion of the installation, including paving, all underground lines connected to *storage tanks* shall be tested for leakage in conformance with Subsection 4.4.6.

4.5.6.6. Marine Service Stations

(1) Except as permitted in Sentence (2), *storage tanks* and pumps not integral with the dispensing unit at *marine service 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* may be installed on a pier provided

(a) the applicable requirements of Subsection 4.3.7. relating to spacing, diking 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 service 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 service stations* may be located aboveground where rock or a high water table make underground *storage tanks* impractical.

(5) Where *storage tanks* at *marine service stations* are at an elevation above the dispensing unit, an electrically operated solenoid valve, designed to open only when the dispensing apparatus is being operated, and to prevent gravity draining of the tank in the event of a rupture of the supply line to the dispensing unit, 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 dispensing units at a *marine service station* shall conform to Section 4.4., except that where dispensing is from a floating structure, suitable lengths of flexible hose designed for this type of application may be employed between the piping on shore and the piping on the floating structure. *

4.5.7. Drainage and Waste Disposal

4.5.7.1. Spill Control and Waste Disposal

(1) Provision shall be made in areas where *flammable liquids* are dispensed to prevent spilled liquid from entering *buildings* or waterways by providing grading or curbing and drainage.

(2) *Flammable liquids* and *combustible liquids* shall be stored in *storage tanks* or *drums* 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), every *service station* shall have at least one attendant on duty when the station is open for business.

(2) *Service stations* which do not serve the general public do not require an attendant.

(3) Except as permitted at *self-service outlets*, a competent employee shall be in constant control of

the dispensing of *flammable liquids* and *combustible liquids* with *flash points* below 60°C into the fuel tanks of motor vehicles, watercraft or aircraft or into *portable containers*.

4.5.8.2. Self-Service Outlets

(1) Instructions for the operation of dispensing units 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 dispensing units so that the attendant has an unobstructed view of all units at the same time.

(3) The control console in Sentence (2) shall be equipped to regulate the operation of each dispensing unit.

(4) A 2-way communication system between the control console and each pump island shall be provided at *self-service outlets*.

(5) At *service 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 shutoff 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 Dispensing Devices.** Except as provided in Article 4.5.8.4., for card or key activated equipment, special type dispensing devices 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 while the outlet is open to the public for each 12 hoses that can be operated simultaneously.

4.5.8.4. Card or Key Operated Dispensing Devices

(1) Card or key activated dispensing devices are permitted at unattended *self-service outlets* and *service 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 dispensing devices shall conform to the requirements for *self-service outlets* and *service stations* in this Section.

(3) Access to card or key activated dispensing equipment shall be restricted to persons authorized by the supply agent to possess a card or key to operate the dispensing equipment.

(4) Clearly legible operating instructions, visible at all times, shall be posted at every dispensing pump island.

(5) A telephone or other clearly identified *accepted* means to notify the fire department shall be provided in an *accepted* location.

(6) Emergency instructions, including the telephone number for the local fire department, shall be conspicuously posted in an *accepted* location that instruct the user, in the event of a spill or accident

(a) to use the emergency shutoff switch described in Article 4.5.4.2., and

(b) to call the fire department.

4.5.8.5. Duties of Attendants

(1) Attendants on duty at *self-service outlets*, *service stations*, and *marine service stations* shall

(a) supervise the dispensing of *flammable liquids* and *combustible liquids*,

(b) not activate the controls to permit the dispensing of fuel at an individual dispensing unit until the customer at the unit is ready to activate the nozzle,

(c) prohibit the dispensing of *flammable liquids* or *combustible liquids* into containers not conforming to Clauses 4.2.3.1.(1)(b), (c) and (d),

(d) 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, *

(e) take appropriate measures to prevent sources of ignition from creating a hazard at the dispensing units,

(f) take appropriate action in the event of a spill to reduce the risk of fire,

(g) shut off the power to all dispensing units in the event of a spill or fire,

(h) notify an *inspector* or *local assistant* forthwith in accordance with Sentence *

4.1.9.1.(4), 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) Attendants on duty at *marine service stations* shall not activate the controls to permit the dispensing of fuel at an individual dispensing unit until all ports and hatches on watercraft or aircraft have been closed.

4.5.8.6. Fuel Dispensing Procedures

(1) Except as provided in Sentence (2) no person shall dispense *flammable liquids* or *combustible liquids* into the fuel tank of a motor vehicle, watercraft or aircraft while the engine is running.

(2) No person shall dispense diesel fuel into the fuel tank of a vehicle while the engine is running unless the fuel is dispensed at least 7.5 m from gasoline dispensing units.

(3) No person shall dispense *flammable liquids* or *combustible liquids* with a *flash point* below 60°C at a *service 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) A person dispensing *flammable liquids* and *combustible liquids* shall

(a) take precautions to prevent overflow or spillage of the liquid being dispensed,
(b) not knowingly overfill the fuel system,
(c) in the event of spillage immediately apply an *accepted* absorbent material to soak up the spillage,
(d) notify an *inspector* or *local assistant* forthwith in accordance with Sentence 4.1.9.1.(4), when a spill or accident occurs that involves *flammable liquids* or *combustible liquids*, and
(e) not dispense *flammable liquids* and *combustible liquids* with a *flash point* below 60°C in proximity to open sources of ignition.

4.5.9. Smoking

4.5.9.1. Smoking. No person shall smoke or use an open flame device within 7.5 m of dispensing locations at *service stations*.

4.5.9.2. Signs

(1) At least one weather-resistant sign prohibiting smoking and conforming to Sentences (2) to (4) shall be provided for each dispensing location.

(2) The signs required in Sentence (1) shall indicate that smoking within 7.5 m of the dispensing unit is not permitted and that the ignition must be turned off while the vehicle is being refuelled. (See Appendix A.)

(3) Signs 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) Signs required in Sentence (1) shall be installed in a location visible to all vehicle operators approaching the dispensing location and at the dispensing unit.

(5) Signs required in Sentence (1) may include the international "No Smoking–Ignition Off" symbols not less than 100 mm in diameter.

4.5.10. Product Losses

4.5.10.1. Liquid Level Measurement. Except for *used oil storage tanks*, the liquid level in *storage tanks* at *service stations* shall be measured in conformance with Subsection 4.3.17. (See Article 4.3.16.1. for leakage testing.)

4.5.11. Fire Protection

4.5.11.1. Portable Extinguishers. At least 2 portable extinguishers each having a rating of not less than 20-BC shall be provided at every *service station* in conformance with Part 6.

4.5.11.2. Absorbent Materials. Noncombustible absorbent material to soak up liquid spillage shall be provided for use by attendants at *service stations* and *self-service outlets*.

* 4.5.12. Inspection and Maintenance

4.5.12.1. Inspection

(1) Operators of *self-service outlets, service stations* and *marine service 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, service stations* and *marine service 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.

* 4.5.12.2. Maintenance

(1) Operators of *self-service outlets, service stations* and *marine service stations* shall inspect and maintain the *cathodic protection* systems on underground *storage tanks* and piping in conformance with

(a) CAN4-S603.1, "Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids," for sacrificial anode systems, or
(b) PACE Report No. 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.

* 4.5.12.3. Corrective Action.

The operator of a *self-service outlet*, a *service station* or a *marine service station* shall ensure that immediate corrective action is taken when a condition is identified that contravenes a provision of Sentences 4.5.12.1.(1) and (2).

* 4.5.12.4. Records.

Accepted records of maintenance and inspections required by Articles 4.5.12.1. to 4.5.12.3. shall be kept in conformance with Article 1.1.5.1.

Section 4.6 Bulk Plants

4.6.1. Application

4.6.1.1. Application. 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 distributing such liquids by pipeline, tank vessel, *tank vehicle* or other container.

4.6.2. Storage

4.6.2.1. Storage. *Flammable liquids* and *combustible liquids* shall be stored in *closed containers* or in *storage tanks* located outside *buildings* in conformance with Section 4.3.

4.6.2.2. Shock Pressure. Bulk *storage tanks*, piping, pumps, valves and associated components shall be designed, installed and maintained to accommodate shock pressure on the system.

4.6.2.3. 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 individual piles need not apply when the containers are stored in an area that does not present a hazard to neighbouring property.

4.6.2.4. Spill Control. Outdoor storage areas shall be graded in conformance with Subsection 4.1.6.

4.6.2.5. Fencing

(1) The area occupied by aboveground *storage tanks* and associated pumps, valves and piping shall be surrounded by a firmly anchored fence.

(2) The fence required in Sentence (1) shall be substantially constructed to discourage climbing, with a minimum height of 1.8 m and with 2 gates which shall be locked when the bulk plant is not in operation or when the enclosure is not staffed.

4.6.3. Heating

4.6.3.1. Heating Appliances

(1) Rooms in which *flammable liquids* are stored or handled shall not contain fuel-burning *appliances* or electric heating elements that could be exposed to the room air.

(2) Rooms containing heating *appliances* shall be located and ventilated to prevent the entry of flammable vapours.

4.6.4. Ventilation

4.6.4.1. Ventilation

(1) Ventilation shall be provided for all rooms in which *flammable liquids* are pumped or dispensed.

(2) Natural ventilation shall be permitted where the pumping or dispensing equipment is part of a closed system.

(3) The design of the ventilation system shall take into account the relatively high specific gravity of the vapours.

(4) Natural ventilation may be provided by means of openings located at floor levels in outside walls and unobstructed except for louvres or coarse screens.

(5) Where natural ventilation is inadequate, mechanical ventilation shall be provided.

4.6.4.2. Basements and Pits. *Flammable liquids* shall not be stored or handled within a *building* having a *basement* or pit unless the *basement* or pit is provided with mechanical ventilation designed to prevent the accumulation of flammable vapours.

4.6.4.3. Electrical Interlocks. Where sufficient mechanical ventilation is provided to prevent dangerous quantities of vapour accumulation, the ventilation system shall be kept in operation while *flammable liquids* are being handled and shall be electrically interlocked with the lighting system and, where practical, to the dispensing equipment, so that the ventilation system will be actuated during dispensing operations.

4.6.5. Dispensing

4.6.5.1. Interconnection. Dispensing systems for *flammable liquids* or *combustible liquids* shall not be interconnected.

4.6.5.2. Dispensing into Vehicles

(1) Apparatus serving the general public for dispensing *flammable liquids* into fuel tanks of motor vehicles 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 the dispensing apparatus in Sentence (1) is supplied from an aboveground *storage tank*

(a) an electrically-operated solenoid valve, designed to open only when the apparatus is being operated, shall be provided at the *storage tank* outlet, and

(b) an emergency valve shall be provided for the dispensing apparatus in conformance with Sentence 4.5.6.3.(2).

(3) 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 not accessible to the public shall be permitted only when *accepted*. *

4.6.5.3. Dispensing and Transferring Inside Buildings. *Flammable liquids* shall be dispensed or transferred inside *buildings* in conformance with Subsections 4.1.7. and 4.1.8. *

4.6.5.4. Dispensing into Metal Containers

(1) *Flammable liquids* shall not be dispensed into metal containers unless the containers are electrically connected in conformance with Article 4.1.8.2.

(2) No person shall dispense *flammable liquids* into a container at a bulk plant unless the container conforms with Subsection 4.2.3. *

4.6.6. Loading and Unloading Facilities

4.6.6.1. Clearances

(1) The distance from the fill stem of a loading or unloading facility for *tank vehicles* or tank cars

to aboveground *storage tanks*, *buildings* and property lines shall be not less than 3 m, measured horizontally, except as otherwise required in General Order No. 0-32, "Flammable Liquids Bulk Storage Regulations," of Transport Canada.

(2) *Buildings* for the shelter of personnel or pumps shall be considered a part of the loading or unloading facility.

4.6.6.2. Multi-Purpose Facilities. 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 another class of liquid is introduced.

4.6.6.3. Check Valves

(1) Systems through which *tank vehicles* or tank cars 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.

4.6.6.4. Control Valves

(1) Valves installed to control the filling of *tank vehicles* shall be of the self-closing type when used for *flammable liquids* or *combustible liquids* with a *flash point* below 60°C.

(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.

4.6.6.5. 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. (See Appendix A.)

(3) Bonding required in Sentence (1) shall consist of metallic bond wire connected to the fill stem or to some part of the rack 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.

(6) Bonding wires or cables shall be not less * than No. 4 flexible stranded copper wire and shall be connected to a ground rod, underground rod or underground metal water pipe.

4.6.6.6. Downspouts

(1) Except as permitted in Sentence (2), where there is a possibility that *tank vehicles* or tank cars contain an explosive vapour-air mixture, or where the liquid being filled can form such a mixture, filling through open domes shall be by means of a downspout which extends to near the bottom of the tank and is shaped to minimize turbulence in the liquid during filling.

(2) The downspout required in Sentence (1) shall not be required when the liquid is one which is not subject to accumulation of static charges.

4.6.7. Fire Protection

4.6.7.1. Portable Extinguishers. At least 2 * portable extinguishers each having a rating of not less than 40-BC shall be provided at hazardous locations in bulk storage plants for *flammable liquids* and *combustible liquids*.

4.6.8. Drainage and Waste Disposal

4.6.8.1. Spill Control. 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.

* **4.6.8.2. Waste Disposal.** *Flammable liquids* and *combustible liquids* that are to be disposed of as waste shall be stored in a *storage tank* or *drum* conforming to this Part until removed from the premises.

Section 4.7 Piers and Wharves

4.7.1. Application

4.7.1.1. Application. This section applies to *flammable liquids* and *combustible liquids* installations on piers and wharves, but does not include *marine service stations*.

4.7.2. General

4.7.2.1. Clearances

(1) Piers and wharves at which *flammable liquid* or *combustible liquid* cargos are to be transferred in bulk quantities to or from tank vessels shall be not less than 30 m from any bridge over a navigable waterway, or from 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. 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) to (4), *storage tanks* shall be installed on shore in conformance with Subsections 4.3.2. to 4.3.11.

(2) *Storage tanks* may be located in *buildings* on piers and wharves of solid-fill or *noncombustible construction* subject to the requirements of Subsections 4.3.12. to 4.3.14.

(3) *Storage tanks* may be buried in piers and wharves of the solid-fill type subject to the requirements of Subsections 4.3.8. to 4.3.11.

(4) *Drums* without *secondary containment* may * be used to supply fuel to heating equipment on piers and wharves.

4.7.4. Piping, Valves and Fittings

4.7.4.1. Installation and Materials. The method of installation and materials used for piping, valves and fittings shall conform to the requirements of 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 wood having no dimension less than 150 mm, or of steel or 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. In areas where general cargo is handled or where piping might be subject to mechanical damage from vehicles or water craft, the piping shall be protected by means of guards.

4.7.4.4. Flexible Connections. Piping * between the shore and piers or wharves shall be provided with swing joints or flexible connections designed for this type of application that permit the independent movement of the pier or wharf and shore piping without strain on the pipe.

4.7.4.5. Shutoff Valves. 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 that will permit inspec- * tions below deck shall be provided for valves referred to in Article 4.7.4.5. and connections to pipelines.

(2) *Accepted* signs shall be posted indicating * the location of valves and connections referred to in Sentence (1).

* **(3)** No person shall place freight or other material on a pier or wharf in a manner that will obstruct the access openings required in Sentence (1).

4.7.4.7. Identification

* **(1)** Identification tags or labels of metal or other suitable material which are impervious to water and to the *flammable liquids* or *combustible liquids* being transferred shall be attached to each pipeline and control valve.

* **(2)** The tags or labels required by Sentence (1) shall be clearly marked to indicate the purpose of the valve or the contents of the pipeline.

* **(3)** The tags or labels required by Sentence (1) shall be maintained in an *accepted* manner.

4.7.4.8. Testing

(1) Piping systems shall be tested in conformance with Subsection 4.4.6. before being put into service and before reactivation when used on a seasonal basis.

(2) Underground piping systems referred to in Sentence (1) shall be tested at least annually.

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. (See Appendix A-4.6.6.5.(2).)

* **(2)** Insulating joints shall be placed in all rails where they enter upon the pier or wharf.

4.7.6. Fire Prevention and Protection

4.7.6.1. Portable Extinguishers

* **(1)** Portable extinguishers having a rated capacity of 40-BC shall be provided in the vicinity of *flammable liquid* pumps and fuelling equipment in conformance with the requirements of 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, suitable portable extinguishers with a rating of not less than 40-BC 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. Instructions to Personnel.

Operating personnel shall be provided with instructions on 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) A sump pit, settling basin or other suitable means shall be provided at transfer stations to carry off possible leakage from hose couplings in conformance with the requirements of Subsection 4.1.6.

(2) Provision shall be made to prevent or contain spillage resulting from the disconnection of hoses.

* **(3)** Noncombustible absorbent materials shall be available to be used in the event of a spill, leak or accident involving *flammable liquids* or *combustible liquids*.

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 shutoff 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.** The transfer of *flammable liquids* or *combustible liquids* between tank vessels and piers or wharves shall be through flexible cargo hose or jointed tubing or piping suitable for the cargo to be transferred and designed to withstand the maximum design working pressure.

* **4.7.8.2. Maintenance and Testing**

(1) Cargo hose shall be
(a) maintained in satisfactory operating condition, and
(b) pressure tested at least annually to one and one-half times the maximum working pressure but not less than 350 kPa (gauge).

4.7.8.3. Supports. 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. Cargo pumps shall be designed and installed in conformance with Subsection 4.4.10.

* **4.7.9.2. Pressure Relief.** Cargo pumps capable of building up pressures in excess of the safe working pressure of the cargo hose shall be provided with return lines or relief valves.

4.7.9.3. Location

* **(1)** Except as permitted in Sentence (2), cargo pumps shall be located on shore or on piers and wharves that are
(a) of *noncombustible construction* or 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 may be installed on piers and wharves of *combustible construction* if located in pump houses in conformance with Subsection 4.7.10., and provided such pump houses are not less than 3 m from other *buildings*.

4.7.10. Pump Houses

4.7.10.1. Construction. 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. Ventilation and venting shall be provided in conformance with the requirements of 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 vessel which is normally manned 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 leaks and, if leaks occur, 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 spill 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.

* **(3)** Flanged joints shall be tightly bolted.

(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, the valves on the hose connections shall be closed, the cargo hose drained into appropriate containers and then 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. Application

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. Location

4.8.2.1. Outdoor Processing Equipment

(1) The location of outdoor processing equipment in industrial processing plants shall be based on its *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.A. for stable liquids, and

(b) 2.5 times those in Table 4.3.2.A. 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.A. for stable liquids, and

(b) 4 times those in Table 4.3.2.A. 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.

4.8.3. Processing Buildings

4.8.3.1. Construction. Except as provided in Article 1.1.4.1., *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 Resistance. Exterior walls of *buildings* where *unstable liquids* or *flammable liquids* having *flash points* below 22.8°C are processed shall be constructed to accommodate pressures from explosion to the extent that the principal load carrying members will remain intact.

4.8.3.3. Fire Separations. Areas in *buildings* 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-resistant rating* of not less than 2 h.

4.8.3.4. Basements and Pits. *Buildings* where *flammable liquids* and *combustible liquids* with *flash points* below 60°C 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.

Processing equipment shall be designed and arranged to prevent the unintentional escape of liquids and vapours and to minimize the quantity escaping in the event of accidental release.

4.8.4.2. Explosion Protection

(1) Where space within chemical processing equipment is likely to contain flammable vapours in concentrations that may be within the flammable range

(a) air within the space shall be displaced by inert gas,
(b) the space shall be provided with an automatic explosion suppressions system, or
(c) the equipment shall be designed to withstand the explosion pressure without damage to the equipment.

4.8.4.3. Fire Protection Systems

(1) Where, in the opinion of the *Fire Authority*, 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 water supply 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 sprinkler systems or other fixed fire suppression systems.

4.8.4.4. Emergency Procedures.

Emergency procedures conforming to Article 4.1.5.7. shall be established for *refineries* and *process plants*.

Section 4.9 Distilleries

4.9.1. Application

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 prepackaged. (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 the relevant requirements of this Part.

(3) Where there is a conflict between the requirements of this Section and other requirements in Part 4, the requirements of 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 Group F, Division 1 *occupancies*.

(2) *Buildings* or parts of *buildings* used for storage of *prepackaged containers* or *distilled beverage alcohols* shall be classified as Group F, Division 2 *occupancies*.

4.9.3. Design, Construction and Use of Storage Tanks and Containers

4.9.3.1. Design, Fabrication and Testing.

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, Anchorage and Protection

(1) Supports, foundations, anchorage and protection 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 fixed fire suppression system. (See Appendix A.)

(3) The area underneath any *storage tank* greater than 1.2 m in diameter shall be protected by an automatic fixed fire suppression system. (See Appendix A.)

4.9.3.3. Storage Tank Vents. 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. Where more than 25 000 L of *distilled beverage alcohol* in *storage tanks*, metal *drums* or wooden barrels are stored inside *buildings*, such *buildings* shall be equipped with an automatic sprinkler system, in conformance with Article 6.5.1.1.

4.9.4.2. Prepackaged Containers. Storage of *prepackaged containers* of *distilled beverage alcohols*, empty bottles and packaging materials shall be in conformance with Section 3.3.

4.9.4.3. Empty Barrels, Pallets and Storage Aids. Storage of empty wooden barrels, combustible pallets and storage aids shall be in conformance with Subsection 3.3.2. (See Appendix A.)

4.9.5. Piping and Pumping Systems

4.9.5.1. Design and Installation. 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. 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, that will prevent the concentration of vapours from exceeding 25 per cent of the *lower explosive limit*, measured 1.5 m from any equipment or from any opening subject to vapour release.

4.9.7. Liquid Spills and Leaks

4.9.7.1. Spill Control. 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., except that, when *accepted*, water-miscible effluent from spills and fire fighting operations shall be permitted to be directed into a sewer system.

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-BC 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-BC 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. 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 monthly and a record of such measurements shall be maintained for inspection,

(b) fill pipe covers, covers over openings used for measuring liquid levels, dispensing facilities and power controls shall be kept locked when not in use,

(c) a *storage tank system* which incorporates an impressed current cathodic protection system shall be maintained and operated while the *storage tank system* is not in service, (see Appendix A, A-4.10.2.1.(3)(c)), and

(d) 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) an *inspector* or *local assistant* shall be notified, in writing, as soon as practical,

(b) the *storage tanks*, connected piping and dispensing facilities shall be emptied of *flammable liquid*,

(c) the *storage tanks*, piping and dispensing facilities which contained *flammable liquid* shall be refilled with a *combustible liquid*, or not less than 1 kg of dry ice for each 500 L of *storage tank* capacity shall be added to the tank,

(d) monthly measurements of the liquid level of each *storage tank* containing a *combustible liquid* shall be made, and a record of such measurements shall be maintained for inspection,

(e) fill pipe covers, covers over openings measuring liquid levels, dispensing facilities and power controls shall be locked, and

(f) a *storage tank system* which incorporates an impressed current cathodic protection system shall be maintained and operated while the *storage tank system* is not in service. (See Appendix A, A-4.10.2.1.(3)(c).)

(3) Where an *underground storage tank system* is operated on a seasonal basis

(a) the liquid level of each *storage tank* shall be measured at the close of each season of operation,

(b) a record of the measurements required by Clause (a) shall be retained and made available for inspection upon the request of an *inspector* or *local assistant*,

(c) fill pipe covers over openings used for measuring liquid levels, dispensing facilities and power controls shall be locked,

(d) prior to the start of an operating season, the liquid level in each *storage tank* shall be measured and recorded,

(e) the records required by Clause (b) shall be compared with the measurements taken in accordance with Clause (d),

(f) if a loss of liquid or water intrusion is apparent from a comparison of the records referred to in Clause (e), immediate action shall be taken to determine and correct the condition, and a report shall be submitted to an *inspector* or *local assistant* in accordance with Clause 4.1.9.1.(4) (b), and

(g) if the *storage tank system* is equipped with an impressed current cathodic protection system it shall be maintained and operated during the period the *storage tank system* is not in service. (See Appendix A.)

(4) When an underground *storage tank* is reactivated for the storage of *flammable liquids* or *combustible liquids*, an *inspector* or *local assistant* shall be notified.

(5) If the *storage tank* in Sentence (4) has been out of service for more than 12 months, the tank and piping shall be tested in conformance with Subsection 4.3.16.

4.10.2.2. Aboveground Storage Tanks

(1) When an aboveground *storage tank* is to be taken out of service for a period not exceeding 180 days

(a) the piping from the tank shall be capped, or

(b) isolation of the tank equivalent to that required by Clause (a) shall be achieved by closing and securely locking the appropriate valves.

(2) The liquid level in the tank referred to in Sentence (1) shall be measured and the readings compared at least monthly.

(3) Where an aboveground *storage tank* will be out of service for a period exceeding 180 days

(a) all liquid and vapours shall be removed from the *storage tank* and its connected piping, and

(b) the *storage tank* markings shall clearly indicate the tank is empty.

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

* (a) an *inspector* or *local assistant* shall be notified in writing at least 30 days prior to the removal of an *underground storage tank system*,

(b) *storage tanks* shall have all *flammable liquids* and *combustible liquids* removed from them,

(c) *storage tanks* shall be purged of vapours, and removed from the ground, and (see Appendix A)

(d) the associated piping shall be

(i) purged of vapours and the ends permanently sealed by capping or plugging, or

(ii) removed from the ground.

(2) If contaminated, soil surrounding the *storage tanks* in Sentence (1) shall be replaced with clean fill or treated to remove contamination. (See Appendix A, A-4.1.9.1.(2).)

4.10.3.2. Abandonment in Place

* **(1)** Where it is impracticable to remove an underground *storage tank*, the *owner* shall apply to the *Fire Authority* 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 *

(a) describe in the application, the reasons why it is impracticable to remove the *storage tank* and provide other information that supports his application,

(b) satisfy the *Fire Authority* that the soil under and around the *storage tank* has not been contaminated with petroleum product, and

(c) 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 *Fire Authority* is satisfied that the tank is

(a) located in whole or in part beneath a permanent *building* or other facility making excavation impracticable,

(b) of a size or type of construction that makes excavation impracticable,

(c) inaccessible to the heavy equipment necessary for removal of the tank, or

(d) situated so that removal of the tank would endanger the structural integrity of nearby *buildings* or other facilities.

(4) If the *Fire Authority* grants permission to * abandon a *storage tank* in place in accordance with Sentence (3) the *owner* shall be notified in writing.

(5) Where the *Fire Authority* grants permis- * sion in accordance with Sentence (3), the *owner* shall

(a) purge the *storage tank* of vapours to less than 10 per cent of the *lower explosive limit*,

(b) check for the presence of vapours using combustible gas detection equipment,

(c) arrange for an *approved* person to enter the *storage tank* and conduct an internal inspection of the tank for perforations,

(d) notify the *Fire Authority* if the tank is perforated,

(e) conduct additional investigations or take remedial actions in accordance with directions issued by the *Fire Authority*,

(f) remove sludge from the *storage tank* and dispose of it in an *accepted* manner,
(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 *accepted* inert material,
(i) register an endorsement on the Certificate of Title filed at the Land Titles Office describing the *storage tank* and its location on the property,
(j) forward a copy of the endorsement referred to in Clause (i) to the *Fire Authority*, and
(k) 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 *Fire Authority*.

4.10.4. Disposal and Reuse of Storage Tanks

4.10.4.1. Disposal. Where *storage tanks* are to be discarded, a sufficient number of holes or openings shall be made 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), underground *storage tanks* shall not be reused for the storage of *flammable liquids* or *combustible liquids*.

(2) No person shall reuse an underground *storage tank* that has been removed from service in accordance with Article 4.10.3.1., unless the tank has been refurbished in accordance with
(a) CAN4-S603(A), "Refurbishing of Steel Underground Tanks for Flammable and Combustible Liquids," for steel *storage tanks*, or
(b) CAN4-S615(A), "Refurbishing of Reinforced Plastic Underground Tanks for Petroleum Fuels," for reinforced plastic *storage tanks*.

(3) No person shall reuse an underground *storage tank* that has been excavated if an inspection or test reveals
(a) denting, pitting or gouging that causes a reduction in the shell thickness in excess of 1 mm, or
(b) a dent that creates a deflection of more than 30° from the normal configuration of the tank.

(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 an *inspector* or *local assistant* shall be advised of the inspection results and the intention to return the *storage tanks* to service.

4.10.4.3. Riveted Storage Tanks. Riveted *storage tanks* shall not be relocated.

Section 4.11 Tank Vehicles

4.11.1. Application

4.11.1.1. Application. This Section applies to *tank vehicles* used for transportation of asphalt and stable *flammable liquids* and *combustible liquids* but does not apply to aircraft servicing vehicles or to fuel tanks used in the operation of motor vehicles. (See Appendix A.)

4.11.2. General

4.11.2.1. Smoking and Open Flames. No person shall smoke or use open flame within 7.5 m of *tank vehicles* while being loaded, unloaded or repaired.

4.11.2.2. Cutting and Welding. No person shall undertake repair work on a *tank vehicle* which involves cutting or welding, until the tanks have been purged of flammable vapours or combustible vapours to less than 10 per cent of the *lower explosive limit*. (See Appendix A.)

4.11.2.3. Damaged or Leaking Containers. 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.

(See Appendix A.)

* **4.11.2.5. Repair and Servicing**

(1) No person shall repair or service the cargo tank of a *tank vehicle* in a *service station* or garage unless

(a) all *flammable liquids* and *combustible liquids* have been removed from the cargo tank and stored in a *storage tank*, safety can or leak proof metallic container constructed and installed in accordance with this Part,

(b) the 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 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 a repair referred to in Article 4.11.2.2. and Sentence (1) unless

(a) the *building* has been *accepted*, 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*.

(3) No person shall use any source of ignition within 15 m of a *tank vehicle* cargo tank that is being repaired pursuant to this Section.

(See Appendix A, A-4.11.2.2. and A-4.11.2.4.)

4.11.3. Transportation of Containers

4.11.3.1. Drums

(1) Except as provided in Article 4.11.3.2., *drums* for *flammable liquids* or *combustible liquids* shall not be transported unless they conform to the requirements of Shipping Container Specifications 5, 5A, 5B, 5C, 5L or 5M of the Canadian Transport Commission.

(2) *Drums* for *combustible liquids* shall not be transported unless constructed of steel not less than 1.14 mm thick.

4.11.3.2. Wooden Barrels. Wooden barrels may be used as containers for *flammable liquids* or *combustible liquids* when the liquids are nontoxic and require such containers as part of their conditioning process.

4.11.3.3. Piling of Containers

(1) Except as provided in Sentence (2), containers of *flammable liquids* and *combustible liquids* which are in excess of 50 L and are not permanently attached to the chassis of the vehicle shall be piled only a single tier high on the vehicle.

(2) Wooden barrels containing *distilled beverage alcohol* may be transported in 2 tiers.

4.11.3.4. Container Design

(1) Except as permitted in Sentence (2), containers used for the transportation of *flammable liquids* or *combustible liquids* having a capacity of 250 L or more shall conform to the requirements for the construction of cargo tanks on *tank vehicles* as defined in CSA-B620, "Highway Tanks and Portable Tanks for the Transportation of Dangerous Goods."

(2) Containers used for the transportation of *flammable liquids* or *combustible liquids* on service vehicles, and having a capacity of 2 500 L or less, shall conform to ULC-Subject C142.13, "Guide for Steel Tanks Mounted on Service Truck Platforms for Transportation of Flammable and Combustible Liquids."

4.11.3.5. Securing of Containers to Vehicles. Except for the transportation of empty tanks, tanks that are not permanently attached to the chassis of a vehicle shall be secured to a cradle or sill which is anchored to the chassis of the vehicle by means of hook-bolts or other devices designed for this type of application.

4.11.4. Loading and Unloading

4.11.4.1. Static Protection

(1) The rate for loading a *flammable liquid* through an open dome or the rate for loading a *combustible liquid* into a compartment which previously contained a *flammable liquid* shall be limited to not more than 20 per cent of the normal flow rate until the downspout is sufficiently submerged to prevent any turbulence from breaking the surface of the liquid.

(2) A bond wire shall be provided from the loading facility to the bonding clip on the *tank vehicle.*

4.11.4.2. Air Space. Filled cargo tanks or compartments shall have an air space not less than 1 per cent of the compartment volume.

4.11.4.3. Multi-Use Compartments. When a compartment of a *tank vehicle* has been used to carry a *flammable liquid,* the compartment, piping and accessory delivery equipment shall be drained of liquid before a *combustible liquid* is loaded.

4.11.4.4. Unloading

(1) Before a *tank vehicle* is unloaded, the volume of the liquid in the receiving tank shall be measured to ensure that the tank can accept the volume to be unloaded.

* **(2)** When a *tank vehicle* is being unloaded the vehicle operator shall remain

(a) in constant view of the transfer nozzle and fill pipe, and
(b) in constant attendance at the discharge control valve.

(3) If tank vents are obstructed, the transfer of liquid shall be stopped.

(4) No person shall park a *tank vehicle* on a *street,* shoulder or sidewalk while unloading at a *service station.*

(5) When bulk deliveries are being made by gravity into underground *storage tanks,* the engine ignition of the *tank vehicle* shall be shut off.

4.11.4.5. Loading. While a *tank vehicle* is being loaded, the person in charge shall be in a position to shut off the flow of liquid in an emergency.

4.11.4.6. Meter Air-Release Mechanisms. Except where a *tank vehicle* compartment is in the same service continuously and will remain in that service, no meter air-release mechanism shall be vented back into that compartment.

4.11.4.7. Refuelling Other Vehicles

(1) Except as permitted in Sentence (2), *tank vehicles* shall not be used to refuel other vehicles.

(2) Vehicles used to refuel equipment on a job site shall conform to

(a) U.S. DOT Specifications MC 306 or MC 307, or
(b) Ontario Fuels Safety Branch Standard MC 306M.

4.11.4.8. Valve Security

(1) Except as provided in Sentence (2), when the outlet valves of a *tank vehicle* are not in use, the valve handles shall be detached or, where the handles cannot be detached, the valves or cabinets containing the valves shall be kept locked.

(2) When stopping the pump by locking the ignition effectively prevents the escape of products, removal of the valve handle and locking the valve or cabinet shall not be required.

4.11.4.9. Dome Covers. Dome covers shall be closed and secured at all times, except that one dome cover may be opened at any time for filling or checking the contents of the compartments.

Part 5
Hazardous Materials, Processes and Operations

Part 5
Hazardous Materials, Processes and Operations

Section 5.1 General

5.1.1. Scope

5.1.1.1. Application. This Part applies to materials, processes and operations that involve a risk from explosion, high flammability or related conditions which create a hazard to life safety.

5.1.2. Means of Egress

5.1.2.1. Means of Egress. Hazardous materials, processes and operations shall be located and the premises maintained so that the *means of egress* will not be obstructed in any manner that would interfere with evacuation of the *floor area* in the event of a fire.

5.1.3. Electrical Installations

* **5.1.3.1. General.** Electrical installations shall conform to the requirements of the Electrical Protection Act and regulations under that Act.

5.1.3.2. Hazardous Locations. Where wiring or electrical equipment is located in areas in which flammable gases or vapours, combustible or electrically conductive dusts or *combustible fibres* are present in quantities sufficient to create a hazard, such wiring and electrical equipment shall conform to the requirements of the Electrical Protection Act and regulations under that Act.

5.1.4. Ventilation

* **5.1.4.1. Ventilation.** Ventilation shall be provided for hazardous locations and processes in conformance with the Alberta Building Code and with the requirements of this Part.

5.1.5. Flash Point

5.1.5.1. Flash Point. The *flash point* of *flammable liquids* and *combustible liquids* shall be determined in conformance with Subsection 4.1.3.

5.1.6. Fire Safety Plan

5.1.6.1. Fire Safety Plan

(1) Except as provided in Sentences (2) and (3), a fire safety plan in conformance with Section 2.8 shall be prepared for areas described in Article 5.1.1.1.

(2) In addition to the information required in Sentence (1), the fire safety plan shall include

(a) the location and identification of storage and use areas for specific products, in conformance with Article 3.3.2.6., and

(b) the names, addresses and telephone numbers of persons to be contacted in case of fire during nonoperating hours.

(3) In addition to the information required in Sentences (1) and (2), where radioactive materials are stored or handled, the fire safety plan shall 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.

* **(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 *accepted* and maintained for fire department inspection and for reference by personnel. (See Appendix A.)

Section 5.2 Explosives and Fireworks

* 5.2.1. Explosives

5.2.1.1. Explosives. The storage, handling and use of explosives, blasting agents, detonators, propellant explosives, pyrotechnics and ammunition shall be in conformance with the Explosives Act (Canada).

* 5.2.2. Fireworks

5.2.2.1. Flares. Articles 5.2.2.2. to 5.2.2.21. do not apply to a person who possesses or discharges *fireworks* commonly used as distress flares.

5.2.2.2. Application

(1) The manufacture and importation of *fireworks* shall be in conformance with the Explosives Act (Canada).

(2) The transportation of *fireworks* shall be in conformance with the Transportation of Dangerous Goods Control Act.

5.2.2.3. Discharge

(1) No person shall discharge *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.

5.2.2.4. 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 *approved*, any other pyrotechnic device.

5.2.2.5. 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 *local assistant*,

(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 the consent required in Subclause (i) together with his application for a permit under this Section to the *local assistant*,

(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 *accepted*,

(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 *accepted*, or

(h) when the wind velocity exceeds 45 km/h or when, in the opinion of the *local assistant*, weather conditions create an undue fire hazard.

(2) An *inspector* or *local assistant* 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.

5.2.2.6. 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) *Accepted* signs reading, "Fireworks - NO SMOKING or OPEN FLAME," in letters at least 100 mm high shall be posted in *accepted* locations in areas described in Sentence (1).

5.2.2.7. 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 Explosive Regulations (Canada).

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

5.2.2.8. Authority

(1) An *inspector* or *local assistant* 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), an *inspector* or *local assistant* may order them disposed of in a safe manner.

(3) Any costs incurred as a result of the seizure or disposal of *fireworks* by an *inspector* or *local assistant* 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 a seizure under Clause (1)(b).

5.2.2.9. Permit

(1) No person shall purchase, possess, handle, discharge, fire or set off *fireworks* unless he holds a permit for that purpose issued by the *local assistant*.

(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 *local assistant* 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 a *local assistant*.

(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) A *local assistant* 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 and regulations under that Act (Canada).

5.2.2.10. Employees. The holder of a permit referred to in Article 5.2.2.9. shall ensure that all of his employees who deal with *fireworks* for the purposes of sale are at least 18 years of age.

5.2.2.11. Building. 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 *accepted*.

5.2.2.12. 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 5.2.2.9.

5.2.2.13. Age Requirement. No person who is under 18 years of age shall purchase, possess, handle, discharge, fire or set off *fireworks*.

5.2.2.14. 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) *accepted* notices are posted at the sales outlet outlining the instructions referred to in Clause (a),
(c) an *approved* 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 an *inspector* or *local assistant*.

5.2.2.15. 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 Explosive Regulations (Canada), 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.

5.2.2.16. 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,
(b) in a cool dry area, and
(c) away from
  (i) an open flame,
  (ii) excessive heat, or
  (iii) spark producing equipment or tools.

5.2.2.17. Discharging. *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.

5.2.2.18. 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 no 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.

5.2.2.19. Extinguisher. A *listed* and *labelled* fire extinguisher having a minimum 2-A rating shall be provided and kept in the immediate discharge area.

5.2.2.20. High Hazard Storage

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

(2) 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 Explosive Regulations (Canada).

(3) Where more than 125 kg gross weight of *high hazard fireworks* are stored, they shall be stored in accordance with the Explosive Regulations (Canada).

(4) *High hazard fireworks* obtained for immediate use in accordance with a permit issued pursuant to Article 5.2.2.9. may be stored in quantities in excess of those specified in this Section if the storage place is
(a) situated in an *accepted* location,
(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.

5.2.2.21. 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, M82-10/1982E, as amended from time to time, published by the Department of Energy, Mines and 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.

Section 5.3 Matches

5.3.1. Storage

5.3.1.1. Application. Notwithstanding the small quantity exemptions provided in Table 3.3.6.A., storage of more than 100 kg of safety matches, or 10 kg of "strike anywhere" matches shall be in conformance with the requirements of Section 3.3. and this Section.

5.3.1.2. Classification. Matches shall be classified, packaged and labelled by the manufacturer as Class 4, Division 1 Flammable Solids, in conformance with the Transportation of Dangerous Goods Regulations.

5.3.1.3. Arrangement. In storage areas regulated by Article 5.3.1.1., shipping cartons containing matches shall be arranged in piles not exceeding 3 m in height and 40 m^3 in volume, and separated by aisles not less than 2.4 m wide.

5.3.1.4. Separation. In mixed storage areas matches shall be stored alone, separated from the remaining storage area by a *fire separation* not required to have a *fire-resistance rating*.

Section 5.4 Nitrocellulose Based Products

5.4.1. General

5.4.1.1. Application. Notwithstanding the small quantity exemptions provided in Table 3.3.6.A., the storage and handling of more than 50 kg of nitrocellulose based products shall be regulated by Section 3.3 and this Section.

5.4.1.2. Classification

(1) Nitrocellulose not classified as explosives shall be classified in conformance with the Transportation of Dangerous Goods Regulations as

(a) Flammable Solids, Class 4.1 *dangerous goods*, or

(b) *Flammable liquids* or *combustible liquids*, Class 3.2 or 3.3 *dangerous goods*.

(2) Nitrocellulose solutions classified as Class 3.2 or 3.3 *dangerous goods* in conformance with Clause (1)(b) shall also be regulated by the relevant requirements in Part 4 of this Code.

5.4.1.3. Fire Suppression Systems. Notwithstanding the provision of Article 3.3.6.9., *buildings* where nitrocellulose is manufactured or stored in quantities exceeding 50 kg shall be *sprinklered* in conformance with Article 6.5.1.1.

5.4.2. Storage of Raw Materials

5.4.2.1. Storage

(1) Nitrocellulose in *drums* shall be stored and handled in conformance with Section 6 - 1 of NFPA 35, "Manufacture of Organic Coatings."

(2) Nitrocellulose that is not stored in conformance with Sentence (1) shall be stored in conformance with Subsection 5.4.4.

5.4.2.2. Identification

(1) Nitrocellulose that is stored in *buildings* together with other materials shall be clearly identified.

(2) Rooms and *buildings* in which nitrocellulose is stored shall be identified at their entrances by signs with letters not less than 50 mm high.

5.4.3. Manufacture

5.4.3.1. Storage of Raw Materials

(1) Not more than 450 kg of raw material used for the manufacture of nitrocellulose based products shall be stored in cabinets in any one workroom, not more than 225 kg stored in any one cabinet and not more than 113 kg in any one compartment of the cabinet.

(2) All raw materials in excess of that permitted in Sentence (1) shall be kept in vented vaults not exceeding 40 m^3 capacity and protected with an automatic sprinkler system installed in conformance with Article 6.5.1.1.

5.4.3.2. Work Areas

(1) In factories manufacturing nitrocellulose based products, *sprinklered* and vented cabinets, vaults or storage rooms shall be provided to prevent the accumulation of excessive quantities of such material in workrooms.

(2) In factories where nitrocellulose plastics are processed, work stations shall be separated by a distance of not less than 1 m.

(3) Material for the manufacture of nitrocellulose plastic articles that is not kept in containers may be placed on tables, workbenches or at machines provided the quantity does not exceed a half day's supply.

(4) In any one workroom the total amount of nitrocellulose plastic materials, including the material in containers and on tables, shall not exceed 70 kg.

5.4.3.3. Waste Handling. All waste nitrocellulose plastic materials, such as shavings, chips, turnings, sawdust, edgings and trimmings, shall be kept under water in metal receptacles until removed from the premises.

5.4.4. Storage of Finished Products

5.4.4.1. Ventilation. Areas where nitrocellulose plastic finished products are stored shall be ventilated so that any decomposition gases produced by the plastics will be vented outdoors to an area where they will not re-enter the *building*.

5.4.4.2. Heating Equipment. Nitrocellulose plastics shall not be stored or handled in rooms which contain fuel-burning *appliances* or electric heating elements and shall not be stored within 600 mm of any steam pipe, radiator or *chimney*.

5.4.4.3. Cabinets and Vaults. Where more than 10 kg of nitrocellulose plastics are stored in any *fire compartment* in a *building*, a vented cabinet or vault constructed in conformance with NFPA 40E, "Storage of Pyroxylin Plastic," and Article 5.4.4.4. shall be provided for such storage.

5.4.4.4. Maximum Quantities

(1) Up to 3 400 kg of nitrocellulose plastics shall be permitted to be stored in a vault which

(a) has a *fire-resistance rating* of not less than 1 h,

(b) is designed to resist an internal pressure of not less than 3.5 kPa,

(c) is not greater than 40 m^3 in volume,

(d) has explosion venting to the exterior of not less than 1 000 cm^2 of venting area for every cubic metre of the vault volume, and

(e) is ventilated to the exterior to provide not less than 200 cm^2 of ventilating area for each cubic metre of vault volume.

(2) Up to 9 000 kg of nitrocellulose plastics shall be permitted to be stored in a vault which

(a) has a *fire-resistance rating* of not less than 4 h,
(b) is designed to resist an internal pressure of not less than 28 kPa,
(c) has explosion venting to the exterior of not less than 650 cm^2 of venting area for every cubic metre of vault volume, and
(d) is ventilated to the exterior to provide not less than 200 cm^2 of ventilating area for each cubic metre of vault volume.

(3) Not more than 9 000 kg of nitrocellulose plastics shall be stored in any vault.

5.4.5. Displays

5.4.5.1. Arrangement

(1) In stores, all displays of nitrocellulose plastic articles that are not in showcases or show windows shall be displayed on tables or counters not more than 1 m wide and 3 m long.

(2) The spaces underneath such tables or counters referred to in Sentence (1) shall be kept free of combustible materials.

5.4.5.2. Luminaries. Luminaries shall not be located adjacent to any nitrocellulose plastic materials so as to create an ignition hazard.

5.4.6. Nitrocellulose Motion Picture Film

5.4.6.1. Use, Storage and Handling

(1) Nitrocellulose motion picture film shall be stored and handled in conformance with NFPA 40, "Storage and Handling of Cellulose Nitrate Motion Picture Film."

(2) Nitrocellulose motion picture film shall not be used, stored or handled in a place of public assembly.

(3) When not in use, all nitrocellulose motion picture film shall be kept in closed, single-reel containers.

Section 5.5 Ammonium Nitrate

5.5.1. General

5.5.1.1. Application. This Section shall apply * to fertilizer grade that contains 60 per cent or more of ammonium nitrate by weight and in quantities exceeding 1 000 kg, but does not include fertilizer storage on railways regulated by Transport Canada or on privately operated farms.

5.5.2. Spatial Separation

5.5.2.1. 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
  (i) any *school*, hospital, hotel, motel, church, theatre, auditorium, sports arena, multi-storey shopping centre, apartment or public hall, and
  (ii) any 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,
(d) 30 m in the case of
  (i) any railway freight station, warehouse, *storage tank* or other storage

or transfer facility used for a combustible or dangerous commodity, 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 *Fire Authority* to be a special hazard.

5.5.3. Storage Buildings

5.5.3.1. Design and Construction

* **(1)** Except as provided in Article 1.1.4.1., ammonium nitrate shall not be stored in *buildings* that are not in conformance with the Alberta Building Code.

(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.)

5.5.3.2. Combustible Floors. Ammonium nitrate shall not be stored on combustible floors.

5.5.3.3. Ventilation

(1) When ammonium nitrate is stored in *buildings*, such *buildings* shall be provided with natural or mechanical ventilation to dissipate gases generated by the ammonium nitrate in the event of a fire. (See Appendix A.)

(2) Ventilation required in Sentence (1) shall be maintained to ensure the system operates as intended. *

5.5.3.4. Breathing Apparatus. Signs indicating that self-contained breathing apparatus shall be used in the *building* in the event of a fire shall be provided adjacent to the exterior of every entrance door in a *building* in which ammonium nitrate is stored.

5.5.4. Storage

5.5.4.1. 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 areas.

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

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

5.5.4.2. Bin Storage. Bins in which ammonium nitrate is stored in bulk shall be kept free of materials which may contaminate their contents.

5.5.4.3. Mixed Storage. In *buildings* containing mixed bulk storage, ammonium nitrate storage bins or piles shall be identified by signs of contrasting colours indicating the contents with letters not less than 50 mm high.

5.5.5. Fire Hazards

5.5.5.1. Smoking and Open Flames

(1) No person shall smoke in a *building* in which ammonium nitrate is stored, except in designated smoking areas established in accordance with Subsection 2.4.2.

(2) Designated smoking referred to in Sentence (1) shall be clearly identified.

(3) Notwithstanding Sentence (1), the *owner* shall ensure that signs prohibiting smoking are posted on a *building* used to store ammonium nitrate.

(4) Signs required by Sentence (3) shall be

(a) in conformance with Article 2.4.2.2., and

(b) located on the exterior of the *building*, near each entrance.

(5) No person shall use an open flame in a *building* where ammonium nitrate is stored, except for

(a) welding and cutting operations conducted in compliance with Section 5.16., and

(b) designated smoking areas established in compliance with Sentence (1).

* **5.5.5.2. Fuel-Fired Heating Appliances.** 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.

5.5.5.3. Industrial Trucks

(1) Industrial trucks used in *buildings* in which ammonium nitrate is stored shall conform to Section 3.4.

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

(3) 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.

(4) Industrial trucks transporting ammonium nitrate shall be cleaned of remaining material following use.

5.5.5.4. Ambient Air Temperature. Ammonium nitrate shall not be stored in a storage facility where the ambient air temperature may rise above 54°C.

5.5.5.5. Disposal. Spilled ammonium nitrate and empty bags shall be disposed of in an *accepted* manner.

5.5.5.6. Explosives. Explosives shall not be used to break up caked ammonium nitrate.

5.5.6. Fire Protection

5.5.6.1. Fire Suppression Systems. Bagged ammonium nitrate in quantities in excess of 600 t shall be stored only in *buildings* equipped with an automatic sprinkler system conforming to Article 6.5.1.1.

5.5.6.2. Portable Extinguishers. Portable extinguishers shall be installed in conformance with Part 6.

Section 5.6 Compressed Gases

5.6.1. General

5.6.1.1. Application

(1) Except as provided in Sentences (3) and (4) storage or handling of *compressed gases* shall be in conformance with this Section.

(2) When quantities of *compressed gases* are greater than the exempt amounts in Table 3.3.6.A., storage and handling of *compressed gases* shall also conform to Section 3.3.

(3) This Section shall not apply to facilities operated by manufacturers or distributors at which *compressed gases* are manufactured, or containers are filled or distributed, provided that storage and handling is in conformance with good engineering practice. (See Appendix A.)

(4) The storage and handling of natural gas and liquified petroleum gases shall be in conformance with the Gas Protection Act and regulations under that Act. *

5.6.1.2. Classification

(1) *Compressed gases* shall be classified in conformance with Part III of the Transportation of Dangerous Goods Regulations as Class 2 *dangerous goods*, and shall be further identified as

(a) Division 1, flammable,
(b) Division 2, non-flammable,
(c) Division 3, poisonous, or
(d) Division 4, corrosive.

5.6.1.3. Transportation. Containers of *compressed gases* shall be transported in devices designed to provide restraint against movement in any direction.

5.6.1.4. Protection Against Mechanical Damage

(1) Containers of *compressed gases* shall be protected against mechanical damage and shall be stored on *racks* or by other *accepted* means designed to hold them securely in place. (See Appendix A.)

(2) Containers of *compressed gases* which are in storage shall be protected against valve damage. (See Appendix A.)

5.6.1.5. Ambient Conditions

(1) Containers of *compressed gases* shall be stored in areas where the ambient air temperature does not exceed 52°C.

(2) Where containers of *compressed gases* are stored indoors, storage areas or rooms shall be dry and ventilated.

5.6.1.6. Prohibited Locations

(1) Except for portable fire extinguishers, containers of *compressed gases* shall not be stored

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

5.6.2. Storage

5.6.2.1. Outdoor Storage. Where containers of *compressed gases* are stored outdoors, they shall be supported on raised concrete or other noncombustible platforms in a fenced enclosure.

5.6.2.2. Fencing. The fence required in Article 5.6.2.1. shall be designed to discourage climbing and shall be substantially constructed with a minimum height of 1.8 m, with a gate which shall be kept locked when the enclosure is not staffed.

5.6.2.3. Clearances

(1) Except as provided in Sentence (2), containers of flammable, poisonous or corrosive *compressed gases* located outdoors shall be

(a) at least 1.5 m from any *building* opening, if the aggregate capacity of expanded gas is not more than 170 m^3,
(b) at least 7.5 m from any *building* opening, if the aggregate capacity of expanded gas is over 170 m^3 but under 500 m^3, and
(c) at least 15 m from any *building* opening, if the aggregate capacity of expanded gas is 500 m^3 or more.

(2) The distances in Sentence (1) need not apply when the opening referred to is into a room conforming to Article 5.6.2.4. or Article 5.6.2.6. which is used for storing the *compressed gases*.

5.6.2.4. Indoor Storage of Flammable Compressed Gases

(1) Except as provided in Article 1.1.4.1., and * Sentences (2) and (3), containers of flammable *compressed gases* stored indoors shall be located in a room constructed in conformance with the Alberta Building Code.

(2) Containers of flammable, lighter than air *compressed gases* may be stored in rooms other than those described in Sentence (1) provided that

(a) in an unsprinklered *building* of *combustible construction*, the aggregate capacity of expanded gas is not more than 60 m^3, and
(b) in a *sprinklered building* of *combustible construction*, or in a *building* of *noncombustible construction*, the aggregate capacity of expanded gas is not more than 170 m^3.

(3) Where a flammable *compressed gas* is heavier than air, only one container of gas may be located in any one room of a *building*, and containers shall not be located in *basements* or other areas below grade.

5.6.2.5. Indoor Storage of Poisonous or Corrosive Compressed Gases

* **(1)** Except as provided in Article 1.1.4.1., containers of poisonous or corrosive *compressed gases* stored indoors shall be located in a room constructed in conformance with the Alberta Building Code.

(2) Containers of poisonous or corrosive *compressed gases* shall not be stored in a room containing combustible or flammable material.

5.6.2.6. Mixed Storage

(1) Containers of *compressed gases* that may react with one another shall not be stored in the same area.

(2) Containers of *compressed gases* shall be separated from other *dangerous goods*, including other *compressed gases*, in conformance with Table 3.3.6.B.

Section 5.7 Reactive Substances

5.7.1. General

5.7.1.1. Application

(1) Storage and handling of reactive substances shall be in conformance with this Section, Section 5.9, or other relevant Sections in this Code.

(2) When quantities exceed the exempt amounts in Table 3.3.6.A., storage and handling of reactive substances shall also conform with Section 3.3.

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

5.7.1.3. Substances Subject to Spontaneous Ignition. 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.

5.7.1.4. Substances Reactive with Water. Reactive substances that may react with water shall be stored in *closed containers* in a dry location.

5.7.1.5. Unstable Substances. 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 separate location in a manner that will prevent the undesired reaction.

5.7.1.6. Storage Room. Reactive substances described in Articles 5.7.1.3. to 5.7.1.5. shall be stored in a cool, well-ventilated room separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* of at least 2 h.

5.7.1.7. Signage. 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 the words, "REACTIVE SUBSTANCE, USE NO WATER," using letters of strongly contrasting colours that are a minimum 450 mm in height and 50 mm in stroke. *

Section 5.8 Poisonous and Infectious Substances

5.8.1. General

5.8.1.1. Application

(1) Storage and handling of poisonous or infectious substances shall be in conformance with this Section.

(2) When quantities are greater than the exempt amounts in Table 3.3.6.A., storage and handling of poisonous or infectious substances shall also conform with Section 3.3.
(See Appendix A.)

5.8.1.2. Classification. Poisonous and infectious substances shall be classified as Class 6 *dangerous goods* in conformance with Part III of the Transportation of Dangerous Goods Regulations.

5.8.1.3. Identification

(1) The location of poisonous or infectious substances in *buildings* or in rooms shall be

(a) clearly marked at all times by means of labels conforming to the Transportation of Dangerous Goods Regulations, or other appropriate legislation, and

(b) identified in the fire safety plan required by Article 5.1.6.1. (See Appendix A.)

Section 5.9 Radioactive Materials

5.9.1. General

5.9.1.1. Fire Safety Plan. Rooms required by the Atomic Energy Control Regulations 1974 to be marked as containing radioactive materials shall form part of the fire safety plan required in Article 5.1.6.1. (See Appendix A.)

5.9.1.2. Separation. *Flammable liquids* or *combustible liquids* or corrosive materials shall not be stored with radioactive materials and equipment.

Section 5.10 Corrosive Substances

5.10.1. General

5.10.1.1. Application

(1) Storage and handling of *corrosive substances* shall be in conformance with this Section.

(2) When quantities are greater than the exempt amounts in Table 3.3.6.A., storage and handling of *corrosive substances* shall also conform with Section 3.3.

5.10.1.2. Classification. This Section shall apply to *corrosive substances* classified as Class 8 *dangerous goods* in conformance with the Transportation of Dangerous Goods Regulations.

5.10.1.3. Ambient Conditions. A storage room for *corrosive substances* shall be dry, cool and well ventilated.

5.10.1.4. Spill Control

(1) Spills and leakages of *corrosive substances* that may occur during storage or handling shall be

(a) contained and neutralized, and

(b) disposed of in conformance with Sentence (2).

(2) Materials or liquids used in cleanup of spills and leakages of *corrosive substances* shall be disposed of in a manner that will not create a fire hazard, or a hazard to public health or safety.

Section 5.11 Oxidizing Substances

5.11.1. General

5.11.1.1. Application

(1) Except as provided in Sentence (2), this Section applies to the storage and handling of *oxidizing substances* in quantities greater than the exempt amounts in Table 3.3.6.A.

(2) Articles 5.11.1.7. and 5.11.1.8. apply, regardless of the quantity of *oxidizing substance* present.

5.11.1.2. Classification. *Oxidizing substances* shall be classified as Class 5 *dangerous goods* in conformance with Part III of the Transportation of Dangerous Goods Regulations.

5.11.1.3. Fire Separations. *Oxidizing substances* shall be stored in cool, ventilated, dry rooms separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* of at least 2 h.

5.11.1.4. Ambient Conditions. A storage room for *oxidizing substances* shall be dry, cool and well ventilated.

5.11.1.5. Fire Suppression Systems

(1) Notwithstanding the provisions of Sentence 3.3.6.9.(2), *oxidizing substances* shall be stored only in rooms that are equipped with an automatic fire suppression system suitable for the hazard in conformance with the Alberta Building Code. (See Appendix A.) *

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

5.11.1.6. Refrigerated Storage. *Oxidizing substances*, including organic peroxides, shall be stored in refrigerated areas where such refrigeration is necessary to stabilize the substances.

5.11.1.7. Storage Precautions

(1) *Oxidizing substances* shall not be stored with any *corrosive substances*, or with any flammable, oxidizable or chemically reactive materials.

(2) *Oxidizing substances* shall not be stored on combustible floors, platforms or pallets.

* **5.11.1.8. Containers and Packaging.** *Oxidizing substances* shall be stored in packages or containers conforming to the Transportation of Dangerous Goods Regulations.

5.11.1.9. Individual Storage Areas

(1) Containers of *oxidizing substances* shall be stored in *individual storage areas* not greater than 6 m wide and 4.5 m high, except that organic peroxides shall not be piled more than 1.5 m high.

* **(2)** The aisles between rows of containers of oxidizing materials shall be at least 1.2 m wide.

5.11.1.10. Facilities for Dispensing

(1) Packages or containers of organic peroxides shall not be opened, or the product dispensed, within the storage room.

(2) Facilities shall be provided outside of storage rooms for opening containers and dispensing organic peroxides.

Section 5.12 Dust Producing Processes

5.12.1. Dust Collection

5.12.1.1. Dust Removal

(1) *Building* and machinery surfaces shall be kept clean of accumulations of *combustible dusts*, in an *accepted* manner, using equipment suitable for use in atmospheres containing *combustible dusts*. (See Appendix A.)

(2) The cleaning equipment required in Sentence (1) and ancillary hoses and tools shall be electrically conductive and shall be bonded to ground.

(3) Tools for vacuum cleaning machines shall be made of materials that will not create electrostatic charges.

(4) Except as permitted in Sentence (1) compressed air or other *compressed gases* shall not be used to blow dust from surfaces inside *buildings*.

5.12.1.2. Dust Collecting Systems and Equipment

(1) Dust collecting systems shall be installed where necessary to keep the accumulation of dust at a safe concentration in the interior of *buildings*.

(2) Dust collecting equipment shall be made of noncombustible material.

(3) Dust collecting systems shall be of a design which will prevent sparks due to physical contact in the fan assembly. (See Appendix A.)

(4) Dust collector systems shall be designed and maintained for an air velocity in the ducts of not less than 18 m/s.

5.12.1.3. Dust Collectors

(1) Except as provided in Sentence (2), dust collectors shall be located outside *buildings* or shall be equipped with exhaust stacks or ducts leading to the outside.

(2) Dust collectors located inside *buildings* shall be designed in conformance with good engineering practice such as those described in the National Fire Protection Association standards on dust explosion hazards. (See Appendix A.)

(3) Dust collectors within *buildings* shall be designed with explosion venting to the exterior.

5.12.1.4. Bonding and Grounding. All electrically conducting parts of duct systems, dust collectors and the machines they serve shall be bonded and grounded.

5.12.1.5. Explosion Venting. Except as provided in Article 5.12.1.7., manufacturing activities that create significant concentrations of *combustible dusts* shall be located only in *buildings* which have explosion venting to the outdoors of not less than 650 cm^2 for each cubic metre of room of *building* volume, with the vents designed to release at a pressure of not more than 1 kPa.

5.12.1.6. Electrical Interlocks. Equipment required to have a dust exhaust system shall not be capable of operating until the dust exhaust system is in operation.

5.12.1.7. Vent Stacks

(1) Permanently open vent stacks may be used to ventilate storage containers where mechanical dust collector 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 container,
(b) are installed not more than 30° from the vertical,
(c) extend from the top of the container to a point not less than 1.2 m above the roof, and
(d) are designed to prevent the entry of snow and rain.

5.12.1.8. Separators. Magnetic or pneumatic separators shall be installed as necessary to prevent the entrance of foreign materials that may cause sparks in equipment such as shellers, crackers, crushers, grinding machines, pulverizes or similar machines which produce *combustible dusts*.

* **5.12.1.9. Ignition Sources.** No person shall smoke or use open flame or spark-producing equipment in areas of *buildings* where combustible dust producing operations are being carried out.

Section 5.13 Combustible Fibres

5.13.1. Storage

* **5.13.1.1. Building Construction.** Except as provided in Article 1.1.4.1., *buildings* used for the storage and handling of baled *combustible fibres* shall comply with the height and area limitations of the Alberta Building Code for Group F, Division 2 *occupancies*.

5.13.1.2. Loose Combustible Fibres

(1) Up to 3 m^3 of loose *combustible fibres* may 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^3 but not exceeding 15 m^3 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^3 but not exceeding 30 m^3 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 more than 30 m^3 of loose *combustible fibres* shall not be stored in an individual room unless the room is *sprinklered* and separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* of at least 2 h.

5.13.1.3. 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^2,
(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^2.

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

(a) the maximum area of any *individual storage area* shall be 500 m^2,
(b) the maximum height of storage shall be 6 m,
(c) piles are separated by aisles at least 1.5 m wide, and
(d) the clearance between piles and *building* walls is not less than 1 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^2,
(b) the maximum height of storage shall be 6 m,
(c) piles are separated by aisles at least 1.5 m wide, and
(d) the clearance between piles and *building* walls is not less than 1 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.

5.13.1.4. Clearance from Sprinklers. The clearance between the top of any pile and sprinkler head deflectors shall be not less than 914 mm.

5.13.1.5. Heating Equipment. Storage areas for *combustible fibres* shall not contain fuel-fired *appliances* or electrical heating elements, and shields shall be provided that will prevent stored material from coming within 300 mm of any part of the heating system.

5.13.2. Fire Protection

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

5.13.2.2. Portable Extinguishers. Portable extinguishers each containing not less than 9 L of water shall be provided in conformance with Part 6.

5.13.2.3. Smoke Venting. Automatic smoke venting hatches constituting not less than 64 cm^2 for each square metre of *floor area*, shall be provided in *buildings* used to store *combustible fibres*.

Section 5.14 Spray Application, Dipping or Coating Processes Using Flammable or Combustible Materials

5.14.1. Operation

5.14.1.1. Standards

* **(1)** Except as required in Sentence (2), the operation of any process involving the use of *flammable liquids* or *combustible liquids* shall conform to

(a) NFPA 33 "Spray Application Using Flammable and Combustible Materials," or

(b) NFPA 34 "Dipping and Coating Processes Using Flammable or Combustible Liquids."

(2) Except as provided in Article 1.1.4.1., 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 5.15 Fumigation and Thermal Insecticidal Fogging

5.15.1. General

5.15.1.1. Application

(1) This Section applies to the fumigation or thermal insecticidal fogging of *buildings*, including the fumigation of equipment or commodities within structures, *tanks*, bins or under tarpaulins.

(2) *Buildings* in which frequent fumigation operations are conducted on a routine basis need not conform to Article 5.15.2.1. (See Appendix A.)

5.15.2. Safety Precautions

5.15.2.1. Notification

(1) Except as permitted in Sentence 5.15.1.1.(2), the *local assistant* shall be notified in writing not less than 24 h before any *building* is to be closed for fumigation and shall be advised of the chemicals to be used, the proposed date and time of use, types of respiratory protective devices required and the degree of flammability of the fumigant or fog being used.

(2) Except as permitted in Sentence 5.15.1.1.(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.

5.15.2.2. Ignition Sources. All flames and other sources of ignition shall be eliminated in a *building* undergoing fumigation or thermal insecticidal fogging.

5.15.2.3. Electric Power. Electric power supply shall be shut off to the premises undergoing fumigation or thermal insecticidal fogging.

5.15.2.4. Air Temperature. The air temperature in the *building* undergoing fumigation or thermal insecticidal fogging shall be kept sufficiently low to prevent the actuation of any sprinkler system.

5.15.2.5. Breathing Apparatus. Protective breathing apparatus shall be made available at the premises undergoing fumigation or thermal insecticidal fogging.

5.15.2.6. Access to Premises

(1) No unauthorized person shall be permitted to enter a premise undergoing fumigation or thermal insecticidal fogging until the premise has been ventilated and is safe for human *occupancy*.

(2) Warning signs shall be posted in a conspicuous location near every unsecured entrance to the premises being fumigated.

(3) One person shall be on duty at each unsecured entrance to premises undergoing fumigation or thermal insecticidal fogging to prevent any person from entering until such premises have been ventilated in conformance with Sentence (1).

Section 5.16 Welding and Cutting

5.16.1. General

5.16.1.1. General. The protection of persons and property from injury or damage by fire or other causes arising from electric and gas welding and cutting equipment, its installation, operation and maintenance, shall conform to CAN/CSA-W117.2, "Safety in Welding, Cutting and Allied Processes," and to the requirements in this Section.

5.16.2. Use and Maintenance of Equipment

5.16.2.1. Fuel Gas Generating Systems. The operation of acetylene generating systems and the storage and generation of welding fuel gases shall conform to NFPA 51, "Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting and Allied Processes," Chapter 6.

5.16.2.2. Piping. Acetylene gas shall not be piped through copper tubing or piping.

5.16.2.3. Containers

(1) Containers of *compressed gas* stored inside *buildings* shall conform to the requirements in Section 5.6.

(2) Gas fuel cylinders, whether full or empty, whose valves are not in a recessed or protected location shall have their caps in place and their valves tightly closed when in storage.

5.16.2.4. Damaged Equipment. No person shall use regulators, hoses and other oxyacetylene welding and cutting equipment which have been damaged.

5.16.2.5. Inspection and Maintenance

(1) Except where the amount of use suggests more frequent examinations and testing, cutting and welding equipment shall be examined for leakage with a leak test solution and for other defects

(a) prior to use, or

(b) at least daily.

(See Appendix A.)

(2) Defects found in cutting and welding equipment shall be repaired prior to use.

5.16.2.6. Equipment Not in Use. All valves shall be closed and lines bled when equipment is not in actual use.

5.16.2.7. Lubrication. No person shall use oil or grease for lubrication of welding and cutting equipment. *

5.16.3. Prevention of Fires

5.16.3.1. Location of Operations

(1) Except as provided in Sentence (2), welding and cutting operations in *buildings* shall be carried out in areas 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 welding and cutting operations in areas described in Sentence (1), combustible and flammable materials shall either be removed at least 11 m from the work area or otherwise protected against ignition by sheet metal or other noncombustible material.

5.16.3.2. Work Adjacent to Piping. Every person welding or cutting near piping containing flammable gas, shall ensure that the section of the piping located within 1 m of the torch shall be covered with wet noncombustible insulating material not less than 6 mm thick. *

* 5.16.3.3. Work on Containers

(1) No person shall weld or cut metal containers until all compartments within such containers have been cleaned of flammable and combustible materials and tested with a *listed* and *labelled* combustible gas detection device to ascertain that such compartments are free of explosive vapours. (See Appendix A.)

(2) No person shall carry out welding or cutting operations on a totally enclosed container.

Part 6
Installation, Inspection, Testing, Maintenance and Operation of Fire Protection Equipment

Part 6
Installation, Inspection, Testing, Maintenance and Operation of Fire Protection Equipment

6.1 General

6.1.1. Scope

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. Inspection, Testing and 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 *approved* standards.

* **(3)** Where a person who carries out the maintenance of a 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 Authority*.

(4) A copy of the noticiation required in Sentence (3) shall be supplied to the *owner* or his authorized agent.

6.1.1.3. Notification. Where tests, repairs or alterations are made to fire protection installations, including sprinkler and standpipe systems, an *accepted* procedure of notification shall be established, and such procedure may include the notification of the fire department and the *building* occupants.

6.1.1.4. Records. Records indicating inspection, testing and maintenance of fire protection equipment required by this Part shall be on *approved* forms and retained for examination by an *inspector* or *local assistant* in accordance with Article 1.1.5.1. (See Appendix A.) *

6.1.1.5. Approvals *

(1) Only an *approved* person shall install, inspect, test or perform maintenance on a lightning protection system described in Section 6.10.

(2) Only an *approved* person shall inspect, test or perform maintenance on

(a) a special fire suppression system described in Section 6.8,

(b) a fire protection system for commercial cooking equipment described in Sentence 2.6.1.9.(1), or

(c) a fire alarm and detection system described in Section 6.3.

6.1.1.6. Qualifications

(1) A person may be *approved*, as required by Sentence 6.1.1.5.(1), if the person *

(a) is proficient in the installation of lightning protection systems, and

(b) demonstrates a thorough working knowledge of CAN/CSA-B72, "Installation Code for Lightning Protection Systems."

(2) A person may be *approved*, as required by Sentence 6.1.1.5.(2), if the person

(a) is proficient at inspecting, testing or performing maintenance on the system for which approval is sought, and

(b) demonstrates a thorough working knowledge of the manufacturer's specifications and the applicable standards.

* **6.1.1.7. Tests and Examinations**

(1) A person applying for approval as required by Article 6.1.1.6. may be required by the Senior Technical Officer, Fire Standards to demonstrate knowledge and proficiency by

(a) undergoing tests or examinations to ascertain whether or not the person satisfies the requirements of Article 6.1.1.6., and

(b) participating in job related training programmes, if the person is not successful in satisfying the requirements of Article 6.1.1.6.

Section 6.2 Portable Extinguishers

6.2.1. General

6.2.1.1. Sale, Lease, Selection and Installation

* **(1)** No person shall sell, lease, offer for sale or lease or install a portable extinguisher unless the extinguisher is *listed* and *labelled*.

(2) Portable extinguishers shall be selected and installed in conformance with NFPA 10, "Portable Fire Extinguishers," and with the requirements of this Code.

6.2.1.2. Standards

(1) Portable extinguishers shall conform to

(a) CAN/ULC-S504, "Dry Chemical and Dry Powder Hand and Wheeled Fire Extinguishers,"

(b) CAN/ULC-S503, "Carbon Dioxide Hand and Wheeled Fire Extinguishers,"

(c) CAN/ULC-S512, "Halogenated Agent Hand and Wheeled Fire Extinguishers," or

(d) CAN4-S507, "9 Litre Stored Pressure Water Type Fire Extinguishers."

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. All instructions for operating, maintaining and recharging portable extinguishers shall be permanently fixed to each unit.

6.2.1.5. Corrosive Atmospheres. Portable extinguishers subject to damage in a corrosive atmosphere shall not be installed where such an atmosphere exists unless appropriate corrosion protection for the extinguisher is provided.

6.2.1.6. Mounting Brackets. 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. 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. 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. Portable extinguishers shall be rated and identified in conformance with CAN/ULC-S508-M, "Rating and Fire Testing of Fire Extinguishers."

6.2.3. Installation Requirements

6.2.3.1. Hazard Protection. 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. (See Appendix A.)

6.2.3.2. Dwelling Units. Portable extinguishers shall be installed in all *buildings* except *dwelling units*.

6.2.3.3. Number of Extinguishers for Class A Fires

(1) The number of portable extinguishers required in each *building* shall conform to Table 3-2.1 of NFPA 10, "Portable Fire Extinguishers," but in no case shall there be less than one portable extinguisher per *storey* having a minimum rating of 2-A, except that portable extinguishers are not required within *dwelling units*.

* **(2)** Where it is apparent that intense fires may occur because of the character or quantity of combustibles, an *inspector* or *local assistant* may require portable extinguishers suitable for the high hazard in addition to those required by this Section. (See Appendix A, A-6.2.3.1.)

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 3-2.1 of NFPA 10, "Portable Fire Extinguishers," may be replaced by hose stations 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 an *accepted* 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 serving the hose stations referred to in Sentence (1) shall be at least 19 mm diam, and the hose shall be equipped with an *accepted* combination water-spray nozzle.

6.2.3.5. Extinguishers for Class B Fires. Portable extinguishers for *Class B fires* shall be provided as required in Table 6.2.3.A.

Table 6.2.3.A.

Forming Part of Article 6.2.3.5.

Portable Extinguishers for Class B Fires		
Grade of Harzard (1)	Basic Minimum Extinguisher Rating, per Unit	Maximum Travel Distance to Extinguishers, m
Light	5-B	9
	10-B	15
Ordinary	10-B	9
	20-B	15
Extra	20-B	9
	40-B	15
Column 1	2	3

Note to Table 6.2.3.A.:

(1) Graded in conformance with NFPA 10, "Portable Fire Extinguishers."

6.2.3.6. Extinguishers for Commercial Cooking Equipment. * Bicarbonate base dry chemical portable extinguishers shall be provided to protect commercial cooking equipment.

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.

6.2.4. Inspection, Testing and Maintenance

6.2.4.1. Inspection, Testing and Maintenance *

(1) All agencies servicing, recharging or carrying out the repair and overhaul of fire extinguishing equipment for fee or commercial gain shall have their facilities and equipment certified *

(a) annually by an *approved* fire testing agency, and
(b) by Transport Canada or its appointee for high pressure hydrostatic testing equipment.

(2) Except as otherwise required in this Section, inspection, testing and maintenance on portable extinguishers shall be in conformance with NFPA 10, "Portable Fire Extinguishers."

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. Retests shall be conducted at the original hydrostatic test pressure as stated on the nameplate.

6.2.4.4. Tags. Each portable extinguisher shall have an *approved* tag securely attached to it showing the maintenance or recharge date, the servicing agency and identification of the person who performed the service.

* **6.2.4.5. Labels.** For low pressure extinguishers a label shall be affixed indicating the month and year that the hydrostatic test or six year maintenance was performed, the servicing agency and identification of the person who performed the service.

* **6.2.4.6. Records**

(1) A written record, in accordance with the Transportation of Dangerous Goods Regulations, shall be kept of all high pressure hydrostatic testing.

(2) Records shall be kept for a period of 12 years.

(3) The month and year that the hydrostatic test was performed and the servicing agency's *approved* identification stamp shall be stamped on the shoulder of the unit.

* **6.2.4.7. Recharging.** After use, portable extinguishers shall be replaced and recharged in conformance with instructions given on the extinguisher nameplate.

Section 6.3 Fire Alarm and Voice Communication Systems

6.3.1. General

6.3.1.1. Maintenance. The *owner* of a *building* shall ensure that the fire alarm and voice communications systems installed in the *building* are maintained in operable condition at all times. *

6.3.1.2. Inspection and Testing

(1) Except as required in Subsection 6.5.3., all components of a fire alarm and detection system shall be inspected and tested at intervals of not more than twelve months in conformance with CAN/ULC-S536, "Standard for the Inspection and Testing of Fire Alarm Systems." *

(2) CAN/ULC-S536, "Standard for the Inspection and Testing of Fire Alarm Systems," is amended *

(a) by striking out Article 5.3.1.2. in its entirety, and
(b) in Article 5.3.6.1. by
  (i) substituting "All" for "one-third" at the beginning of the Article,
  (ii) striking out "such that each device will have been tested on a three year cycle" at the end of the Article, and
  (iii) substituting a period for a comma following "instructions."

(3) Notwithstanding Sentences (1) and (2), other inspection and test methods may be used when *approved*. *

(4) Fire alarm and detection system components shall be accessible for purposes of inspection or maintenance.

6.3.1.3. Records. *Accepted* records shall be kept of all tests required by Article 6.3.1.2., and such records shall be retained for examination by an *inspector* or *local assistant* in conformance with Article 1.1.5.1.

6.3.1.4. Proprietary Signalling Systems. Proprietary signalling systems shall be maintained in conformance with NFPA 72D, "Installation, Maintenance and Use of Proprietary Protective Signalling Systems."

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) Required voice communications systems that are not integrated with a fire alarm system shall be tested monthly 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 communications 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 *local assistant*, 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*.

* **6.3.1.7. Audit.** When an existing fire alarm system has not been subjected to an initial verification as required by CAN/ULC-S524, "Standard for Installation of Fire Alarm Systems," and described in CAN/ULC-S537, "Standard for Verification of Fire Alarm System Installations," an *inspector* or *local assistant* may require the system to be audited in conformance with CAN/ULC-S536, "Standard for Inspection and Testing of Fire Alarm Systems," unless he is satisfied that the system has been maintained and is functioning in an *accepted* manner.

* **6.3.1.8. Signal Transmission.** 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) Where a *dwelling unit* is leased by the *owner* to another person, the *owner* or his authorized agent shall

(a) ensure *smoke alarms* within the *dwelling unit* are tested and cleaned prior to occupancy by the tenant, and
(b) provide notice to each tenant prior to occupancy of the advisability of testing and maintaining the *smoke alarms* on a regular basis.

(2) Sentence (1) does not apply to a *dwelling unit* that is

(a) located in a hotel or motel,
(b) a mobile recreation vehicle, or
(c) a tent.

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 14, "Installation of Standpipe and Hose Systems." (See Appendix A.)

(2) 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

(a) 5 years from the date of purchase of the hose, and
(b) every 3 years thereafter, or
(c) whenever the hose is repaired.

(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.

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 Cabinets

* **(1)** Standpipe hose cabinets shall be used for fire protection equipment only and shall be identified in accordance with the Alberta Building Code.

(2) Hose cabinets shall be inspected monthly to ensure that the hose is in proper position and that all of the equipment is in place and in operable condition.

* **(3)** Sentence (2) does not apply to a hose cabinet that has an *approved* tamper proof device.

* **6.4.1.4. Defects.** Standpipe and hose systems having defects shall be repaired or replaced where necessary.

6.4.1.5. Tests After Alteration or Period of Disuse. 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 one year 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) Every 5 years, the standpipe system shall be flow tested 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 a legible condition.

* **(2)** 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, and

(b) a sign is posted on each fire department connection indicating what portion of the system is out of service.

(3) Protective caps on fire department connections shall be kept in place at all times.

(4) Where protective caps are missing, the fire department connections shall be examined for accumulated refuse, back flushed when conditions warrant, and the caps replaced.

6.4.1.8. Records. A record shall be kept of all tests required by this Section, and such records shall be retained for inspection by an *inspector* or *local assistant*, in conformance with Article 1.1.5.1.

Section 6.5 Automatic Sprinkler Systems

6.5.1. General

6.5.1.1. Design and Installation. 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. No person shall close a sprinkler control valve in the event of a fire until the fire is extinguished or is considered by the fire department to be under control. *

6.5.1.3. Changes in Ambient Conditions. * Changes to equipment or to an *occupancy* which might result in temperatures at sprinklers rising 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. 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. No person shall place * obstructions so as to interfere with the effectiveness of water discharge from sprinklers. (See Appendix A.)

6.5.1.6. Sprinkler Guards. Sprinklers shall be * protected by *accepted* sprinkler guards where there is the possibility of mechanical damage.

6.5.1.7. Protection of Combustible Sprinkler Piping. * 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 *accepted* area.

(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. Programmed Repairs.** Where it is necessary to temporarily shutdown a sprinkler system, the person responsible for the shutdown shall take appropriate steps to ensure that the system is restored to normal use as quickly as possible.

* **6.5.2.2. Protection During Shutdown.** During an interruption of normal sprinkler protection, emergency hose lines and portable extinguishers shall be provided, extra watch service shall be placed on duty and, where practical, temporary water connections shall be made to the sprinkler system.

* **6.5.2.3. Restoration of Sprinkler Protection.** Full sprinkler protection shall be restored or alternate protection shall be provided in accordance with Article 6.5.2.2. at any time work on the system is discontinued.

* **6.5.2.4. Identification of Closed Valves.** Closed sprinkler valves shall be tagged or identified in an *accepted* manner. (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 13A, "Inspection, Testing and Maintenance of Sprinkler Systems."

* **(2)** Variations from the requirements of Sentence (1) may be *approved*.

6.5.3.2. Notification

(1) 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.

(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 *local assistant* 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 *local assistant* and notifies the *owner* or his agent. *

(4) Sentences (2) and (3) do not apply to industrial or manufacturing facilities maintaining their own *fire brigades*. *

6.5.3.3. Records. A record shall be kept of all tests and operations of each system, and this record shall be retained for examination by an *inspector* or *local assistant*, in conformance with Article 1.1.5.1. *

6.5.3.4. Electrical Supervisory Signal Testing

(1) Where an electrical supervisory signal service is provided for a sprinkler system, all initiating and transmitting devices shall be tested in conformance with Sentences (2) and (3).

(2) All transmitters and water flow actuated devices shall be tested at 2-month intervals.

(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 of not more than 6 months.

6.5.3.5. Alterations to Sprinkler Systems

(1) After repairs or alterations are made to any sprinkler system

(a) all 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

(c) all alarm and supervisory devices shall be checked to ensure they will function properly.

6.5.3.6. Flushing of Mains. Before a 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) All 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) The mains and connections referred to in Sentence (1) shall be considered to have failed the test if leakage exceeds 2 L per h per 100 joints for pipe laid with rubber gasketted joints, or 30 mL per 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. 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.** For dry-pipe systems the clapper of the differential type 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 referred to in Article 6.5.3.8.

6.5.3.10. Air Testing. At seasons of the year that will 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, and the tests described in Article 6.5.3.7. and 6.5.3.8. performed when hydrostatic pressure testing can be conducted without danger of freezing.

6.5.3.11. Main Drain Test *

(1) At least one main drain test shall be conducted annually to ensure that the water supply available to the sprinkler system has not been reduced. (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 Vent Valves

(1) Dry-pipe valves shall be trip tested annually with the control valve partially open.

(2) Dry-pipe valves shall be trip tested at least once every 3 years with the control valve fully open using the inspector's test valve.

6.5.3.13. Alarm Testing. All mechanical and electrical alarms shall be tested to ensure that they are in operative condition.

6.5.3.14. Waterflow Alarm Tests *

(1) Waterflow alarm tests using the inspector's test connection shall be performed annually on all wet pipe sprinkler systems.

(2) Except as provided in Sentence 6.5.3.4.(1), or 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 monthly on all sprinkler systems.

6.5.3.15. Defective Devices. 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), all valves controlling sprinkler water supplies or alarms shall be inspected weekly to ensure that they are in the open position.

(2) Valves which are locked open shall be inspected at least monthly.

(3) Valves which are electrically supervised shall be inspected at least once every 2 months.

6.5.4.2. Accessibility and Operability. Sprinkler control valves shall be accessible and maintained in operable condition at all times.

6.5.4.3. Pits. Pits containing sprinkler control valves shall be kept free of water and protected against freezing.

6.5.4.4. Reopening of Control Valves. 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. Sprinkler piping and hangers shall be kept in good repair.

6.5.4.6. Dry-Pipe Systems. 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. Air pressure on dry-pipe automatic sprinkler systems shall be read weekly, and the system shall be maintained at the required pressure.

6.5.4.8. Winter Drainage. Auxiliary drains shall be drained before each winter.

6.5.4.9. Protection Against Freezing. Dry-pipe valve rooms or enclosures in unheated *buildings* shall be inspected daily 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. 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 least once every 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. Sprinklers shall be inspected at least once a year 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 an *approved* agency for testing, and this procedure shall be repeated every 10 years thereafter.

(2) When sprinklers are required to be tested in conformance with Sentence (1), not less than 6 sprinklers of each type shall be tested, except that not less than 2 sprinklers per floor per individual system shall be tested.

6.5.4.14. Defective Sprinklers. 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, not less than 6 spare sprinklers,

(b) for installations containing from 301 to 1 000 sprinklers, not less than 12 spare sprinklers, and

(c) for installations containing more than 1 000 sprinklers, not less 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. 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. 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.** Valves controlling water supplies to fire protection systems shall be inspected weekly to ensure that they are fully open and are sealed or locked in that position.

6.6.1.3. Ice Accumulations. Water supply systems for fire protection shall be kept free of ice accumulations.

6.6.1.4. Antifreeze Solutions. 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. 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. An annual inspection shall be made of all tanks for fire protection, tank supporting structures and water supply systems including piping, control valves, check valves, heating systems, mercury gauges and expansion joints to ensure that they are in satisfactory operating condition.

6.6.2.2. Tank Heating Equipment. Tank heating equipment and accessories shall be inspected daily 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 daily 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 daily 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 least once every 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. Where cathodic protection equipment is installed to prevent corrosion of steel tanks, arrangements shall be made for annual inspections and maintenance of equipment.

6.6.2.6. Inspection of Gravity Tanks

(1) Gravity tanks shall be inspected annually to ensure that the tank roof is tight and in good repair, that hatches or doors are kept closed and properly secured and that the frostproof casing of the tank riser makes a tight joint with the bottom of the tank.

(2) Gravity tanks shall be overflowed monthly to ensure that they are full.

6.6.2.7. Housekeeping. The space between overflow pipes and the tops of gravity tanks, the valve pits at the bottoms of the risers and the entire area around the bases of the columns of tanks shall be kept free of rubbish and waste materials.

6.6.2.8. Expansion Joints. 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 weekly 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. The water level in the fire pump reservoir shall be observed weekly and maintained at the proper level.

6.6.3.2. Pump Room Temperature. 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 least weekly 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 electric motor, the tests described in Sentence (1) shall be performed at least monthly.

(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)** *Storage tanks* shall be drained and refilled in conformance with Article 6.7.1.5.

* **(5)** Fire pumps shall be tested at full rated capacity at least once every 3 years.

* **(6)** Tests required by Sentence (5) shall be conducted in conformance with NFPA 20, "Installation of Centrifugal Pumps."

* **6.6.3.4. Records.** Records shall be kept of all fire pump tests, and such records shall be retained for examination by an *inspector* or *local assistant*, in conformance with Article 1.1.5.1.

6.6.4. Hydrants

6.6.4.1. Maintenance

(1) Hydrants shall be maintained in operating condition.

(2) Hydrants shall be kept clear of ice, snow and other obstructions and their locations shall be clearly identified.

6.6.4.2. Inspection Frequency. Hydrants shall be inspected semi-annually and after each use in conformance with Article 6.6.4.4. and shall be tested annually in conformance with Article 6.6.4.5.

6.6.4.3. Records. Records of inspections and tests in Article 6.6.4.2. shall be retained for examination by an *inspector* or *local assistant*, in conformance with Article 1.1.5.1. *

6.6.4.4. Inspections and Repairs

(1) Hydrants shall be inspected to ensure that hydrant caps are in place and that caps with worn, rusted or obstructed threads, which might hamper easy removal, are 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, *accepted* measures shall be taken to prevent the freezing of accumulated water.

6.6.4.5. Annual Flushing. Hydrants shall be flushed annually with the main valve and any outlet valves fully opened until the water runs clear.

6.6.4.6. Alterations and Repairs. When alterations or repairs are being made to hydrants, the person making the alterations or repairs shall notify the *local assistant* before they are made. (See Appendix A.) *

6.6.4.7. Shutdowns. No person shall shutdown or otherwise impair the operation of a hydrant unless he first notifies and obtains the approval of the *local assistant*. (See Appendix A, A-6.6.4.6.) *

Section 6.7 Emergency Power Systems and Unit Equipment for Emergency Lighting

6.7.1. General

6.7.1.1. Inspection, Testing and Maintenance. 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, "Emergency Electrical Power Supply for Buildings" and CAN/CSA-Z32.4, "Essential Electrical Systems for Hospitals."

6.7.1.2. Notification. When an emergency power system or any part thereof is shutdown, the *supervisory staff* shall be notified in conformance with Section 2.8.

6.7.1.3. Instructions. 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. Written records shall be maintained as required in CAN/CSA-C282, "Emergency Electrical Power Supply for Buildings" and CAN/CSA-Z32.4, "Essential Electrical Systems for Hospitals."

6.7.1.5. Supply of Fresh Fuel. *Storage tanks* shall be drained and refilled with fresh fuel at least once a year. (See Appendix A.)

6.7.1.6. Inspection of Unit Equipment

(1) Self-contained emergency lighting unit equipment shall be inspected monthly to ensure that

(a) pilot lights are functioning and not 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, and

(d) the battery surface is kept clean and dry.

(2) Self-contained emergency lighting unit equipment shall be tested

(a) monthly to ensure that the emergency lights will function upon failure of the primary power supply and emergency light heads are directionally correct, and

(b) annually 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.

Section 6.8 Special Fire Suppression Systems

6.8.1. General

6.8.1.1. Sale or Lease. No person shall sell, lease, offer for sale or lease or install a special fire suppression system described in Section 6.8., or a fire extinguishing system for commercial cooking equipment described in Article 2.6.1.9., unless the system is *listed* and *labelled.*

6.8.1.2. Standards

(1) Except as otherwise provided in this Section, no person shall install a special fire suppression system unless it conforms to

(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 Systems and Foam-Water Spray Systems,"

(h) NFPA 17, "Dry Chemical Extinguishing Systems,"

(i) NFPA 17A, "Wet Chemical Extinguishing Systems," or

(j) NFPA 18, "Wetting Agents."

(2) Except as otherwise provided in this Section, no person shall inspect, test, service or otherwise maintain a special fire suppression system referred to in Sentence (1) unless the inspection, testing, servicing or maintenance performed conforms to the requirements of the appropriate standard referenced 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 least every 6 months.

* **6.8.1.3. Records.** Written records shall be kept of all periodic tests carried out in conformance with Article 6.8.1.2., and such records shall be retained for examination by an *inspector* or *local assistant*, in conformance with Article 1.1.5.1.

6.8.1.4. Instructions. Operating and maintenance instructions shall be posted in proximity to the equipment and shall be located near manual controls when such controls are provided.

6.8.1.5. Identification. Valves and controls shall be marked to clearly indicate their function and shall be accessible at all times.

6.8.1.6. Container Maintenance. 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 maintained.

6.8.1.7. Discharge Outlets. Discharge outlets for special fire suppression systems shall be kept free of dirt and residue.

6.8.1.8. Piping. Piping and equipment shall be mechanically secure and accessible for cleaning and maintenance.

* **6.8.1.9. Replacement Equipment.** Replacement equipment and devices provided for special fire suppression systems shall be *accepted* for the installation in which they are to be placed.

* **6.8.1.10. Change in Hazard.** An increase in a hazard for which a special fire suppression system has been designed shall not be permitted unless *accepted* fire protection measures are made to accommodate 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 firefighting hose by a municipal fire department or *fire brigade* unless the couplings and fittings comply with this Section.

(2) Threaded firefighting hose couplings and fittings shall have threads that are

(a) 38 mm Straight Iron Pipe Thread (S.I.P.T.) on 38 mm couplings, or

(b) 3.15 threads per cm with a major thread diam between 75.95 mm and 75.69 mm for male threads and 76.45 mm for female threads on 65 mm couplings.

(3) All firefighting hose couplings shall meet the test requirements of ULC-S513, "Threaded Couplings for 1½ inch and 2½ inch Fire Hose," for pull, compression, hardness, and corrosion resistance.

(4) All firefighting hose with internal lug quick-connect couplings shall be in conformance with CAN4-S543, "Internal Lug Quick-connect Couplings for Fire Hose."
(See Appendix A.)

Section 6.10 Lightning Protection Systems *

6.10.1. General

6.10.1.1. Compliance. No person shall sell, offer for sale, install or maintain lightning protection systems unless that person complies with this Section.

6.10.1.2. Installation. A person who installs a lightning protections 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. Sentence 6.1.1.5.(1) does not prevent an *approved* person from using unskilled persons to assist with the installation of lightning protection systems if the *approved* person oversees the installations and is satisfied before issuing the certificate of installation required by Article 6.10.4.1. that the installation complies with this 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 Senior Technical Officer, Fire Standards, 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. The Senior Technical Officer, Fire Standards, 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 an *approved* certificate of installation to

(a) the person for whom the installation was carried out, and

(b) the Senior Technical Officer, Fire Standards.

Part 7
Inspection, Testing and Maintenance of Fire Emergency Systems in High Buildings

Part 7
Inspection, Testing and Maintenance of Fire Emergency Systems in High Buildings

Section 7.1 General

7.1.1. General

* **7.1.1.1. Application.** Part 7 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, "Measures for Fire Safety in High Buildings," of the Supplement to the NBC 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.** An *accepted* 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 an *inspector* or *local assistant*, in conformance with Article 1.1.5.1.

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 (6).

(2) The keys required to recall elevators and * to permit independent operation of each elevator shall be kept in the location required by Subsection 3.2.6. of the Alberta Building Code.

(3) The fire fighters' elevator identification * required in Subsection 3.2.6. of the Alberta Building Code shall be maintained in an *accepted* condition.

(4) 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.

(5) Windows and panels provided for venting *floor areas* shall be maintained so as to be openable without the use of keys.

(6) Vents to vestibules permitted to be manually openable shall be maintained in an operable condition.

Section 7.2 Inspection, Testing and Maintenance

7.2.1. Intervals Between Tests

7.2.1.1. Intervals Between Tests. Except * as specifically prescribed in this Part, all tests specified in this Section and Section 7.3 shall be carried out at intervals of not more than 6 months, except that longer intervals between tests may be 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 an *accepted* manner 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 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 firefighter use, shall be identified in an *accepted* manner and tested to ensure that when in the "On" position

(a) the key cannot 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,

(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 an *accepted* manner 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.

7.2.2.2. Tests. 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 *accepted*. *

(3) A *closure* in an opening to the outdoors at the top of a smoke shaft shall be tested to ensure that it will open

(a) manually from outside the *building*,

(b) on a signal from the *smoke detector* in the smoke shaft, and

(c) when a *closure* in an opening between a *floor area* and the smoke shaft opens.

7.2.3.2. Elevator Recall. In addition to the procedures described in Article 7.3.2.1., all elevators in an elevator shaft that is intended 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 changes 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.** An *accepted* record of all the ventilation features to aid firefighting in the *building*, including the location and intended method of operation, shall be developed from the plans or from an audit and a copy of this record shall be kept in the *building* in accordance with Sentence 2.8.2.4.(2). (See Appendix A.)

7.2.4. Central Alarm and Control Facility

7.2.4.1. Fan Controls. 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. 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.

Section 7.3 Inspections and Test Procedures for Smoke Control Measures

7.3.1. General

7.3.1.1. Application. 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 *accepted* arrangements are included in the fire safety plan. (See Appendix A.)

7.3.1.2. Doors in Means of Egress. 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 2.7.1.1. when the entire smoke control system is being tested.

7.3.1.3. Record. An *accepted* record of all the smoke control features in the *building*, including location and intended method of operation, shall be developed from the plans or from a system audit and a copy of this record shall be kept on site. (See Appendix A.) *

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

(f) doors to vestibules, if normally held open, will close automatically and remain closed.

(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 intent.

Appendix A
Explanatory Material for the Alberta Fire Code 1992

A-1.1.4.1. 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, which does not conform to requirements of this Code, but is considered to provide a reasonable level of fire safety due to its specific qualities.

This Code contains references to the Alberta Building Code for the design, construction and installation of many fire protection features. Some Alberta Building Code 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 acceptable level of safety be achieved rather than necessarily achieving strict conformance to the Alberta Building Code.

The application of this Code to the upgrading of existing facilities to provide an acceptable degree of life safety should be based on the judgement of the enforcement authority, who must deal with each case on its merits. The Fire 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, who is in a position to assess the relative significance of variances from the Alberta Building Code requirements. Such authority may then determine that upgrading measures are not necessary, on the basis that the existing arrangement represents an acceptable level of life safety. See also the appendix note A-2.1.3.1.(1).

A-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.

A-1.2.1. Fire separation. A fire separation may or may not have a fire resistance rating.

A-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. Service room. Typical examples of service rooms include boiler rooms, furnace rooms, incinerator rooms, garbage handling rooms, janitors' closets 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. 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 Appendix to this document is included for explanatory purposes only and does not form part of the requirements. The bold-faced reference numbers that introduce each item apply to the requirements in this Code.

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 this 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 Alberta Building Code 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. The method of determining building height in the Alberta Building Code has been changed from previous editions, and application of the current method to existing buildings for the purposes of this Code could result in certain buildings being reclassified as high buildings. For this reason, the Fire Code suggests that building height is that which was established by the applicable building code at the time of construction, whether original construction or subsequent to construction 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. (See Article 2.3.1.5.)

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 Alberta Building Code represents the desired minimum acceptable level of safety for all buildings; it is therefore appropriate for the Alberta Fire Code to require existing buildings to comply with the Alberta Building Code as much as possible. It is usually difficult to change structural features of an existing building, but installation of "active" fire protection systems, such as alarms, sprinklers, and standpipes, in existing buildings may be possible. Such 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 current Alberta Building Code.

Sentence 2.1.3.1.(1) is intended to require installation of fire alarm, sprinkler and standpipe systems in existing buildings presently not so equipped, and to require upgrading of existing systems that do not provide an acceptable level of safety to meet the current installation standards specified in the Alberta Building Code. It is not intended that existing fire protection systems that provide an acceptable level of safety be upgraded with each new edition of the Alberta Building Code. 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 Alberta Building Code as provided for in Sentence 1.1.4.1.(1) and as clarified in Appendix A, A-1.1.4.1.(1).

A-2.3.1.3. Fire officials have interpreted this Sentence to mean that natural Christmas trees are not allowed in any Group A or Group B occupancy. This is not the intent. The intent of this Section is to ensure that festive decorations, which include Christmas trees are sufficiently "flame resistant" so as to not constitute a fire hazard in occupancies where large numbers of persons gather or are incapacitated.

This Sentence means that festive decorations, including Christmas trees (natural or artificial), that are intended to be used in any Group A or Group B occupancy are to be resistant to flame either inherently or by the application of an approved flame retardant material.

Natural Christmas trees are considered to be inherently "flame resistant" if freshly cut and the base is kept in fresh water during the time they are in use.

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 thoroughly dry, Christmas trees are without question the most flammable item to be found in a home. Once ignited, the speed and intensity of burning is extreme. A dry tree will appear to literally "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) The 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 for 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) then, 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-2.4.1.5.(3) 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."

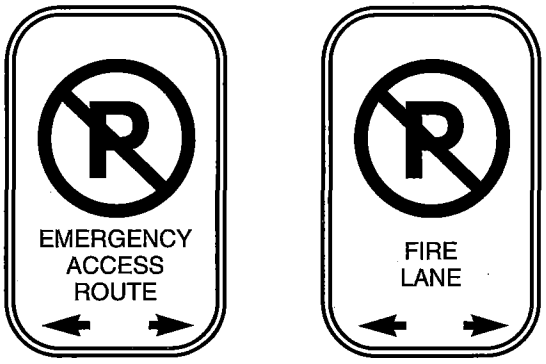
A-2.4.1.6.(4) Containers for combustible recyclable materials should not be located in areas where there is the likelihood of sources of ignition being introduced to the contents. Lunch rooms, coffee rooms and staff lounges are building areas where persons congregate and, in some cases, are permitted 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 an outbreak of fire.

It is recognized that in some buildings, persons are allowed to smoke in all or a major portion of the building. Ignition of the contents of these containers is, therefore, a distinct possibility should a person in the area carelessly discard smoking materials. In an effort to minimize this hazard, a prohibition against discarding smokers materials into these containers is provided in Sentence 2.4.2.1.(3).

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, the 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. 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 -.081 High tensile aluminum; or 1/2" 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.

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 may 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 the 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 the accumulation of combustible deposits on the chimney and flue pipe walls.

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-2.7.1.3.(1) The Fire Code uses two criteria to determine the maximum permissible occupant load in existing buildings: the exit capacity, and the anticipated occupant load calculated from Table 3.1.16.A. of the Alberta Building Code. Assuming that exit capacity is sufficient, Table 3.1.16.A. ensures that a crowd of people will be able to move steadily toward the exits.

Table 3.1.16.A. 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.

It is not recommended that Table 3.1.16.A. be used as the sole determining factor in establishing the maximum occupant load for rooms and spaces in existing buildings. It is recommended that in existing buildings the process be calculated in reverse, from the measured exit capacity to a maximum occupant load. The result of these calculations may not be, and is not intended to be, consistent with values obtained using Table 3.1.16.A. but it will provide confirmation of the capacity of the exiting system to provide for the occupant load.

Area per person in Table 3.1.16.A. 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 nonfixed items, such as tables, chairs, millwork and movable partitions.

It should also be noted that Article 2.1.3.1. of this Code requires fire alarm systems to be installed in conformance with the Alberta Building Code. This means that if the occupant load determined exceeds that for which a fire alarm system is required by the Alberta Building Code, a fire alarm system must be installed in the building.

A-2.7.1.4.(2) Sentence 3.1.16.1.(2) in the Alberta Building Code 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.A.

A-2.7.3.1.(1) Subsections 3.2.7., 3.4.5. and 3.4.6. of the Alberta Building Code describe the requirements for placement of exit signs, and emergency and non-emergency lighting requirements.

A-2.8.1.2. 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 liquids or combustible liquids or other dangerous goods are stored.

A-2.8.2.1.(2)(a)(i) These procedures should also include instructions to 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.(2)(a)(iv) Fire safety for disabled persons in buildings 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 disabled occupants of what these provisions are by means of posted notices or handouts. In certain residential occupancies, such as hotels or motels, staff should be aware of which rooms are occupied by disabled persons and should notify the responding fire department of these facts.

A-2.8.2.1.(2)(g) The fire safety plan can include the checking of certain building features provided for fire safety. This should include checking the operation of the central alarm and control facility in high buildings as outlined in Part 7 of this Code.

A-2.8.2.7.(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 made based on the nature of the occupancy.

It may be necessary to hold additional fire drills outside of 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. The type of fire alarm and emergency communications 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 communications system, as defined in the Alberta Building Code, 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.(1) In a renovation project, only the portion undergoing demolition is covered by this Subsection. The requirements for the portion under-

going construction are covered by the Alberta Building Code and Section 2.15 of this document.

A-2.14.1.1.(2) In certain buildings which do not pose an exposure hazard to other buildings, or in which there is little fire hazard to staff, such as in small buildings, the degree of application of this Subsection may be minimal. The degree of application should be determined in advance in conjunction with the authority having jurisdiction.

A-2.14.1.2.(2)(c) The control of hazards in and around buildings also includes fire protection for combustible refuse on the demolition site. The size of piles of refuse and the location of such piles in relation to adjacent buildings are factors which must be addressed in determining which fire protection measures should be used. The selection of fire protection measures must 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) 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 of the structure and the surrounding buildings.

A-2.15.1.1. Construction projects can range from a large multi-storey building to small single-storey residences and may include additions or renovations to an existing building. The degree to which Section 2.15 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 site conditions.

A-3.2.2. As each property has its own special conditions of yard use, its own stock handling methods and its own problems of topography, only conformity to basic fire protection principles is required. These requirements are intended to be applied by the authority having jurisdiction with due consideration of the local factors involved.

A-3.2.2.2.(1) The width of the clear space should be based upon the severity of exposure, which will vary with the area, height, occupancy, construction and protection of the exposing structure and the type of piling and height of adjacent lumber piles.

A-3.2.2.2.(2) Large pieces of timber and flat-piled stock may be stored or piled on the perimeter of the yard to act as a barrier between stickered piles and adjoining properties or buildings.

A-3.2.2.8.(2) Factors to be considered in assessing the required space around refuse burners and incinerators include the size and design of the burner, the size and design of the spark arresting screen, the prevailing winds and the location and arrangement of yard storage.

A-3.2.2.12.(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 piling 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-3.2.3. As each property has its own special conditions of yard use, its own stock handling methods and its own problems of topography, only conformity to basic fire protection principles is required. These requirements are intended to be applied by the authority having jurisdiction, with due consideration of the local factors involved.

A-3.2.3.2. Buildings or other structures near chip piles may pose a serious hazard, so that space should be maintained between such piles and exposing structures, yard equipment or stock, depending on the degree of exposure. Additional clearance is desirable when piles are high and side slopes are greater than 60°.

A-3.3.1.1.(1) Section 3.3 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-3.3.2.2.(2) A main aisle running the full length of the building may not always be necessary, provided the fire department has adequate access to the interior of the storage area for fire fighting and overhaul operations. Adequately spaced cross aisles, for example, each accessible from the exterior of the building, would provide such access.

A-3.3.2.2.(3) Access aisles in this Sentence 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. The width of subsidiary aisles within individual storage areas is determined by material handling needs.

The use of dead-end aisles in storage areas should be minimized because of the potential hazard they create with respect to egress.

A-3.3.2.3.(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-3.3.2.3.(6) Clearance between stored products and heating equipment must also be maintained in conformance with Section 2.6 of this Code, which references Part 6 of the Alberta Building Code for installation requirements for heating systems. All stored combustible materials should be kept away from hot elements of heating equipment.

A-3.3.2.4.(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 or storage aids.

A-3.3.3.2.(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-3.3.3.3.(4) NFPA 13 and NFPA 231 do not provide sufficient information on design of sprinkler systems in buildings used for the storage of prepackaged containers of distilled beverage alcohol. Design criteria representing "good engineering practice" for such sprinkler systems are available in such documents as Factory Mutual Engineering Corporation (FM) Data Sheet 8-8.

A-3.3.4.2. 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-3.3.5.3. 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 anaesthetics, 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 carburettor 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 Chemical 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 is described in the Controlled Products Regulations. This test measures the length of flame projection of a jet issuing from the spray nozzle, and requires a highest hazard symbol on products that have the longest flame. Flame projection is a function of flammability of the base product and the propellant, pressure in the can, and the design of the spray nozzle. The flame projection test measures the susceptibility of the aerosol spray to ignite, which 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 other Canadian regulations and the Level 1, 2 or 3 classification system used in this Code is not reliable. The Factory Mutual Engineering Corporation classification system used

in this Code 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. It may in some cases be overly conservative to treat all aerosols bearing the highest hazard flammability symbol as determined by the flame projection test as Level 3 aerosols. On the other hand, it may not be conservative enough to treat products that represent a moderate hazard by the flame projection test, because of a fortuitous nozzle design or low can pressure, as only Level 2. This Code has adopted the aerosol classification system developed by Factory Mutual Engineering Corporation in the U.S. because it is most appropriate to fighting moderate to large fires in buildings.

A-3.3.5.6. Factory Mutual Engineering Corporation Data Sheet 7-29S, "Storage of Aerosol Products," is considered to represent good engineering practice for design of sprinkler systems in aerosol storage areas.

A-3.3.6.3. Parts 4 and 5 of the Fire Code specify ventilation rates to prevent the build up of dangerous concentrations of flammable vapours in rooms used for storing certain dangerous goods. Where no guidance is given, the design of the ventilation system should conform to good engineering practice. Recommendations in the National Fire Protection Association standards, or in the Manual of Recommended Practice for Industrial Ventilation, produced by the American Conference of Governmental Industrial Hygienists, would be considered examples of good engineering practice.

A-3.3.6.6.(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 legislation.

A-3.3.6.9.(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 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 dangerous goods 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 Fire Code refers to the Alberta Building Code, which sets the basic criteria for sprinkler systems in Subsection 3.2.5., "Provisions for Fire Fighting." 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 gaseous fire extinguishing agent.

It is assumed that the fire extinguishing system will be designed by persons experienced in such design, using good fire protection engineering practice to establish design criteria, such as type of suppressant to use, and rate of application.

A-3.3.6.10. Venting of smoke and other products of combustion may 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-3.3.6.11. 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, as far as possible. The fire safety plan should include measures for responding to a situation where the containment area could be overtopped.

A-3.3.6.12.(2) Access to at least two 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-3.3.6.12.(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 3.3.6.12.(3) requires access openings into buildings used for the storage of dangerous goods to be wider than otherwise required by the Alberta Building Code.

A-3.3.6.13. Fire fighters need to identify the substances they may encounter during a fire. Labelling of products or waste material to comply with the Workplace Hazardous Materials Information System (WHMIS) or other provincial, territorial or federal legislation is deemed to satisfy this requirement.

A-3.3.6.14.(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-3.5.3.1. 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-3.5.3.2.(1) This Subsection applies to the outdoor storage of tires or shredded tires where the bulk volume of stored product exceeds 300 m^3 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-3.5.3.11.(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 APPENDIX B - 1989, "Water Supplies for Suburban and Rural Firefighting."

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 Fire Authority.

A-4.1.1.1.(1) The all-inclusive phrase "buildings, structures and places" includes but is not limited to tank farms, bulk plants, service stations, industrial plants, refineries, process plants, distilleries, piers, wharves and airports that are not subject to over-riding federal control. Part 4 of the Fire Code applies wherever flammable or combustible liquids are used or stored, except as specifically exempted in Sentence 4.1.1.1.(2).

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 fire protection engineering practice and on such factors as manual fire suppression equipment, daily inspections, automated transfer systems, location of processing units, and special diking, piping, controls and materials used.

A-4.1.2.1.(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 Fire Code. In the Fire Code, 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 TDG Regulations, 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 "com-

bustible liquids" in the Fire Code terminology. The TDG Regulations do not include Class IIIA liquids that have a flash point above 60°C.

The TDG Regulations further classify flammable liquids into Division 1, 2 and 3, depending on their flash points. Division 1 flammable liquids have flash points below -18°C; Division 2 flammable liquids have a flash point 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 this Code 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 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 Fire Code 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 flammable liquids when heated to their flash point temperature.

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 mm^2/s (cgs), not stokes or centistokes. One centistoke has units of 1 millimetre square per second (1 mm^2/s).

For purposes of comparison, the kinematic viscosity of water is 1.0038 mm^2/s at 20°C; of glycerine, approximately 1 185 mm^2/s; and some common motor oils, near 1 000 mm^2/s. Some paints, lacquers and glues have much higher kinematic viscosities, as indicated by the upper limit of 15 000 mm^2/s in ASTM D 3278.

Table A-4.1.2.1.

Forming Part of A-4.1.2.1.

Comparison of NFC and TDGR Classification Criteria for Flammable and Combustible Liquids			
Flash Point, °C	Boiling Point °C	NFC Classification	TDGR Classification
below -18°	N/A	IA	3.1
at or above -18° and below 22.8°(1)	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°(2)	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
Column 1	2	3	4

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.

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 D5, "Test for Penetration for Bituminous Materials," may be considered to be a liquid.

A-4.1.5.10.(1)(2) Limited quantities of flammable liquids may be stored or used in basements where it is clear 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-4.1.7.1. Sentences 3.3.1.2.(5) to (12) in the Alberta Building Code specifies that ventilation must be provided in conformance with the relevant portions of Part 6 of that Code if flammable vapour, gas or dust could create a fire or explosion hazard. However, Part 6 of the Alberta Building Code 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. The requirements in Subsection 4.1.7. of the Fire Code represent a minimum level of "good practice" for preventing an accumulation of explosive concentrations of vapours from flammable liquids or combustible liquids.

A-4.1.8.2.(1)(b) Build-up of static electric charges near the surface of liquids being poured into non-conducting containers may 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-4.1.9.1.(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 clean up 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-4.2.2.3.(2) Flammable liquids and combustible liquids are classified as Class 3 dangerous goods in accordance with the Transportation of Dangerous Goods Regulations (TDGR). However, Class 3 dangerous goods include liquids with flash points up to 61°C, which means that Class IIIA combustible liq-

uids with flash points above 61°C are not treated as dangerous goods. For the purposes of this Article, Class IIIA combustible liquids should be treated as Class 3 dangerous goods as described in Table 3.3.6.B.

A-4.2.3.1.(1)(e) The intention of this Clause is to allow regulatory officials to use conventional sample containers to take away samples of flammable or combustible liquids in the course of their duties.

A-4.2.5.3. Article 4.2.5.3. addressed 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 paint.

A-4.2.7.5.(2) Requirements pertaining to spatial separation of buildings are found in Subsection 3.2.3., "Spatial Separation and Exposure Protection of Buildings," in the Alberta Building Code.

A-4.2.7.7. Options for acceptable fixed fire suppression systems for protection of flammable liquid or combustible liquid storage areas include: automatic sprinkler, foam sprinkler, water spray, carbon dioxide, dry chemical or halon systems. Appendix D of NFPA 30, "Flammable and Combustible Liquids Code," represents good engineering practice for design of sprinkler or foam water systems for flammable liquid and combustible liquid storage areas.

A-4.2.7.8.(2) Containers of flammable liquids 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 area. The clearance may be omitted for narrow shelves along a wall, where the backs of the shelves can be inspected from the aisle.

A-4.2.8.1. Subsection 4.2.8. applies to those portions of an industrial plant where the use and handling of liquids is only incidental, or secondary to the principal business. The word "incidental" does not imply "small quantity," or "insignificant amount." An automobile assembly plant is one example of a location where use of flammable liquids or combustible liquids is secondary to the principal activity. Cleansers, protective coatings, or paints are used at various locations along the assembly line. The principal activity is production of automobiles, but flammable liquids are used in certain portions of that activity. Other examples include plants for construction of electronic equipment, furniture manufacturing industries, and fabricators of reinforced plastic tanks or boats.

A-4.2.8.4.(1)(a) Sources of ignition include, but are not limited to, open flames, lightning, smoking, cutting and welding, hot surfaces, frictional heat, static, electrical and mechanical sparks, spontaneous ignition, heat producing chemical reactions and radiant heat. The fire separation required in the article should also prevent the passage of vapours.

A-4.2.11.3. Requirements for location and design of access routes for fire department vehicles are contained in Subsection 3.2.5. of the Alberta Building Code.

A-4.3.7.2.(1) 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.

A-4.3.7.2.(2) 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.(2) When the height of a dike exceeds 1.8 m, there is an increased potential for heavier-than-air vapour to accumulate at ground level within the dike enclosure. Depending on the nature of such a vapour accumulation, it may be of an explosive nature or may be of sufficient toxicity to seriously endanger personnel. Entry into such an enclosure should always be preceded by sufficient testing for such a vapour accumulation.

A-4.3.7.7. Guidelines for the protection of storage tanks may be found in the standards published by the National Fire Protection Association, Insurers' Advisory Organization of Canada, Industrial Risk Insurers and the Factory Mutual System. Such guidelines may be considered as good engineering practice in assessing the protection necessary for tanks.

A-4.3.8.1.(4)(b)

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 an inspector.

(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 4.3.1.2.(1)(b), (c) and (d) or subsequent ULC listing for double-walled underground storage tanks, and 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, it must consist of a synthetic membrane, and

(i) be capable of preventing lateral, as well as vertical migration of stored product,

(ii) have a permeability rate to water equal to or less than 1×10^{-6} cm/s,

(iii) must not deteriorate in an underground environment or in the presence of petroleum, and

(iv) be installed such that the containment floor has a uniform gradient of 1 to 100 or a water bottom to a minimum depth of ½ the distance between the liner floor and the tank bottom.

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 double-walled, non-metallic piping, it shall be approved and constructed in accordance with ULC-C107C-M84, "Guide for Glass Fibre Reinforced Plastic Pipe and Fittings for Flammable Liquids,"; or CAN/ULC-S633-M90, "Standard for Flexible Underground Hose Connectors," and the outer wall must completely enclose the inner wall to provide 360° double-wall protection that will completely contain product leaks. The interstitial space can be monitored for tightness, or

(b) An Impervious Liner - if the secondary containment system consists of an impervious liner for all piping trenches, it must consist of a synthetic membrane and have qualities consistent with impervious liners for tanks and be installed such that the trench liner slopes down to the tank excavation at a uniform gradient of 1 to 100.

A-4.3.8.1.(4)(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 approved by an inspector. 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, capable of performing daily inventory reconciliation and performing a total system test mode which is capable of detection of 0.95 or greater and a probability of false alarm of 0.05, or less.

(d) Daily inventory control data that is statistically analyzed by computer on a monthly basis, capable

of probability of detection of 0.95 or greater with a probability of false alarm of 0.05, or less.

(e) Other technologies that have been approved.

A-4.3.8.1.(4)(f)

Pressurized Piping Systems. Line leak detectors on pressurized piping systems include a line leak detector capable of detecting a leak of 11 L/h at 69 kPa (2.5 gallons at 10 psi) within one hour. Systems that combine line leak detection and interstitial space monitoring are acceptable. 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 check valve which is installed immediately below the dispenser. If the 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) Where applicable, the following ULC standards shall be used to repair structural damage to underground storage tanks:

CAN4-S603(A), "Refurbishing of Steel Underground Tanks for Flammable and Combustible Liquids,"

CAN4-S615(A), "Refurbishing of Reinforced Plastic Underground Tanks for Petroleum Fuels."

A-4.3.8.9.(2) 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-4.3.9.1.(2) PACE Report No. 87-1, "Guideline Specification for the Impressed Current Method of Cathodic Protection for Underground Service Station Tankage," published by the Canadian Petroleum Products Institute (CPPI formerly PACE), is considered good engineering practice for this application.

A-4.3.9.3.(1)(a) 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 CAN4-S603.1M, cathodically protected tank are designed to protect the tank only. Inadequate corrosion protection of CAN4-S603.1M 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-4.3.12.1.(2) The Fire Code requires all buildings to conform to the Alberta Building Code with respect to alarm, sprinkler or standpipe systems, and means of egress. Thus the requirements in the Alberta Building Code for fire protection systems in F-1 occupancies apply to buildings regulated under this Subsection. However, in applying Alberta Building Code 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 A, A-1.1.4.1. should be taken into consideration.

A-4.3.12.8.(1) For design of normal and emergency venting of indoor storage tanks, Sentence 4.3.12.9.(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 overstressing the tanks shell or its supports, and resistance to earthquake forces in areas subject to earthquake forces, should be taken into consideration.

A-4.3.13.3.(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-4.3.14.4. Examples of devices to prevent overflow include liquid level monitoring devices with alarms, float valves, preset meters on the fill line, valves actuated by the weight of the tank contents, low head pumps which are incapable of producing overflow or liquid-tight overflow pipes at least one pipe size larger than the fill pipe and discharging by gravity back to the outside source of liquid or to a safe location.

A-4.3.16.1.(1) A precision test is a test acceptable to the inspector or local assistant which will determine if a tank and piping system is tight or not tight. The test must be capable of detecting a tank or piping leak as small as 0.38 L/h with a probability of detection equal or greater than 0.95 and a probability of false alarm equal to or less than 0.05, 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 an inspector or local assistant, a leak test report shall be forwarded to the inspector or local assistant 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 tanks tested,
(d) date of test,
(e) result of test,
(f) testing firm and certification number, and
(g) test method used.

Air or nitrogen testing of piping shall be considered an acceptable precision leak test provided the testing is conducted in conformance with Subsection 4.4.6.

A-4.3.16.1.(2) Methods for testing to determine the location of leaks include ultrasonic, magnetic particle and videographic 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-4.3.18.3.(2) An inspector may deem the age of a storage tank to be unknown unless the owner provides the inspector with either the date of installation or the date of manufacture.

A-4.3.19.1.(1) Used oils often contain both oil and more volatile flammable liquids, such as gasoline and solvents. The hazard presented by the mixture is governed by the more volatile component. Since there is no way to ensure that more volatile liquids are not mixed with the oil, used oils should be treated as flammable liquids.

A-4.3.19.1.(4) Haulers of used oil for recycling or disposal at present insert 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.

A-4.4.3.1.(2) An expert corrosion panel concluded that all steel underground piping is subject to corrosion. Galvanized pipes do not have sufficient zinc coating to achieve long term corrosion protection.

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-4.5.2.2.(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-4.5.2.9.(2) PACE Report No. 87-1, "Guideline Specification for the Impressed Current Method of Cathodic Protection of Underground Service Station Tankage," published by the Canadian Petroleum Products Institute (CPPI formerly PACE), is considered good engineering practice for this application.

A-4.5.3.2.(2)(b) Acceptable measures to ensure proper safety in the use of fixed dispensing equipment include the measures described in NFPA-30, "Flammable and Combustible Liquids Code."

A-4.5.8.4.(1) The authorized holder of a card or key, having received adequate instruction 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 dispensing units, which could be operated by anyone.

A-4.5.9.2.(2) Examples of signs for use at service stations are shown below.

A-4.6.6.5.(2) CTC 1982-8 RAIL was published in Canada Gazette, Part II, Vol. 116, No. 23, dated December 8, 1982, Registration No. SOR/82-1015, dated November 19, 1982. Copies may be purchased from: Supply and Services Canada, Publishing Centre, Ottawa, K1A 0S9.

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 per cent 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.(2) & (3) 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. Additional guidance can be obtained from NFPA 13, "Installation of Sprinkler Systems," and NFPA 15, "Water Spray Fixed Systems."

A-4.9.3.3. 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 may be achieved by directing breather vents and emergency vents, equipped with flame arresters or pressure/vacuum valves, to the outside of the building. However, on existing tank installations the 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 acceptable 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 hazardous location classifications of the Electrical Protection Act and regulations under that 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-4.9.4.3. Article 3.3.2.4., which refers to combustible pallets and storage aids, applies also to the storage of empty combustible barrels.

A-4.9.5.1. Piping and pumping systems should be designed to recognized engineering standards and accepted industry practice.

A-4.10.2.1.(3)(c) An impressed current cathodic protection system only provides protection against

corrosion when it is on and maintained. To avoid corrosion problems on unoperational tanks the impressed current system should be left on and maintained.

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 R015, "Cleaning Petroleum Storage Tanks" provide information on safe procedures for such operations.

A-4.11.1.1. Additional safeguards may be necessary for tank vehicles used for the transportation of flammable or combustible liquids having properties which introduce unusual factors, such as high rates of expansion, instability, corrosion and toxicity. Attention is directed to the fact that some cutback asphalts have flash points below 37.8°C, and liquids having a flash point higher than 93.3°C, such as asphalt may assume the characteristics of lower flash point liquids when heated.

A-4.11.2.2. 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 safe procedures for such operations.

A-4.11.2.4. Senior Technical Officer, Fire Code Interpretation 92-FCI-001, "Buildings Used for the Storage, Repair or Servicing of Tank Vehicles," is considered to represent the criteria necessary to ensure that tank vehicles being stored, repaired or serviced do not put people and property at risk.

A-5.1.6.1. CAN/CSA-Z731 "Emergency Planning for Industry" may provide information to assist in establishing a fire safety plan.

A-5.5.3.1.(2) Copper or its alloys should not be used where they may come in contact with ammonium nitrate as they may react with it to form potentially explosive mixtures.

A-5.5.3.3. The purpose of the ventilation is to remove and dissipate the gases from burning ammonium nitrate. One of the major gases given off by such combustion is nitrous oxide which, in sufficient quantities, can create problems for fire fighters.

A-5.6.1.1.(3) For purposes of this exemption, a distributor is deemed to be a commercial enterprise if the distributor is regularly handling or storing more than 1 500 kg of compressed 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," represents good engineering practice for the handling of compressed gases. It may be obtained from the Compressed Gas Association Incorporated, 1235 Jefferson David Highway, Arlington, VA, 22202.

A-5.6.1.4.(1) Cylinders containing compressed gas shall be protected against mechanical damage and shall be stored on racks or by other "accepted" devices designed to hold them securely in place.

Gas manufacturers, distributors, transfill depots, subdivisions, and company depots may "interlock" or "dovetail" cylinders in storage if the employees are adequately trained in the proper methods of handling, storing and checking cylinders in storage.

A-5.6.1.4.(2) 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 covers.

A-5.7.1.2. Reactive substances may include various classes of dangerous goods, such as Division 1, 2 or 3 Class 4 flammable solids, oxidizing substances, organic peroxides, unstable or reactive liquids or unstable gases.

A-5.8.1.1. The presence of Class 6 dangerous goods, poisonous or infectious substances in a building creates a complication for fire fighting. Subsection 3.3.6. provides for notification of the fire department and maintenance of a fire safety plan,

for premises storing dangerous goods. Section 5.8.1. is provided to clarify that measures must be taken to protect against these products becoming involved in a fire and to ensure that the fire department is fully informed of the presence of such products.

A-5.8.1.3.(1)(b) The fire safety plan should address the need for special antidote, disinfecting or cleanup kits when dealing with poisonous or infectious substances.

A-5.9.1.1. The details for making rooms containing 100 times the scheduled quantity are contained in Subsection 22(4) of the Atomic Energy Control Regulations.

A-5.11.1.5. In most cases the automatic fire suppression system will be a sprinkler system. Other types of fire suppression systems should only be used if the stored materials could react dangerously with water.

A-5.12.1.1.(1) Vacuum equipment should be used to remove as much dust as possible from surfaces inside buildings. Where it is not possible to effectively remove dust by vacuuming, alternative measures may be used including careful use of compressed air or low velocity water sprays or water streams. These alternative methods can dislodge dust and create a dust-air mixture that may present an explosion hazard. The following measures should be taken to minimize the risk of an explosion:

(a) remove all sources of ignition,

(b) isolate the area to be cleared of dust from other operating areas,

(c) de-energize all machinery and equipment, including lighting equipment, in the dust removal area, unless such equipment is suitable for use in Class I, Group G, Division 1, Hazardous Locations, as defined by the Electrical Protection Act and regulations under that Act,

(d) use non-sparking material for all equipment used in the dust removal process, including hoses, nozzles and wands, and

(e) use the minimum air pressure or water velocity necessary to dislodge the dust.

A-5.12.1.2.(3) This is intended to prevent sparking caused by contact between the fan blade and the casing or between a foreign object and the fan assembly.

A-5.12.1.3.(2) National Fire Protection Association Standards on dust explosions include

NFPA 61A, "Standard for the Fire and Dust Explosions in Facilities Manufacturing and Handling Starch,"

NFPA 61B, "Standard for Prevention of Fire and Explosions in Grain Elevators and Facilities Handling Bulk Raw Agricultural Commodities,"

NFPA 61C, "Standard for the Prevention of Fire and Dust Explosions in Feed Mills,"

NFPA 61D, "Standard for the Prevention of Fire and Dust Explosions in the Milling of Agricultural Commodities for Human Consumption,"

NFPA 65, "Standard for the Processing and Finishing of Aluminum,"

NFPA 91, "Standard for the Installation of Blower and Exhaust Systems for Dust, Stock and Vapor Removal or Conveying,"

NFPA 120, "Standard for Coal Preparation Plants"

NFPA 480, "Standard for the Storage, Handling and Processing of Magnesium,"

NFPA 481, "Standard for the Production, Processing, Handling and Storage of Titanium,"

NFPA 482, "Standard for the Production, Processing, Handling and Storage of Zirconium,"

NFPA 650, "Standard for Pneumatic Conveying Systems for Handling Combustible Materials,"

NFPA 651, "Standard for the Manufacture of Aluminum of Magnesium Powder,"

NFPA 654, "Standard for the Prevention of Fire and Dust Explosions in the Chemical, Dye, Pharmaceutical and Plastics Industries,"

NFPA 655, "Standard for the Prevention of Sulfur Fires and Explosions,"

NFPA 664, "Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities."

A-5.14.1.1.(2) 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 protect-

ing 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 Alberta Building Code.

A-5.15.1.1.(2) It is anticipated that arrangements will be made with the authority having jurisdiction and the occupants of neighbouring buildings when fumigation is undertaken on an ongoing basis.

5.16.2.5.(1) Factors that will determine the need for more frequent testing and examination of cutting and welding equipment include the frequency of moving equipment, the surrounding conditions and the general activity in the area where the equipment is being used.

A-5.16.3.3.(1) 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-6.1.1.2. Both the Alberta Building Code and the Fire Code 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 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-6.1.1.4. The forms outlined in "NFPA, Fire Protection Systems, Inspection, Test and Maintenance Manual" may be used to satisfy this Article. If a more comprehensive form is required to provide additional information it may be submitted for approval.

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 the adequate training of personnel are among measures to be considered to minimize hazards.

A-6.2.2.1. Certain combustible metals and reactive chemicals require special extinguishing agents or techniques. NFPA 49-1991, "Hazardous Chemicals Data," may 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 contribution 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," Section 4-7, should be inspected in accordance with NFPA 14A, "Inspection, Testing and Maintenance of Standpipe and Hose Systems," Section 3-10, 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, 1990 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 practi-

cal, an appropriate location for the test should be selected in consultation with the fire authority.

A-6.5.1.1. This reference to the Alberta Building Code is intended to lead primarily to Alberta Building Code Subsection 3.2.5., "Provisions for Fire Fighting." Articles in that Subsection specify the appropriate standard for design and installation of automatic sprinkler systems (NFPA 13), and provide for several exceptions or supplementary requirements. On occasion, other pertinent provisions in the Alberta Building Code may apply. However, where a specific hazard is not addressed by the Alberta Building Code, such as high piled storage, storage of flammable and combustible liquids or rubber tires, the Fire Code directly references the applicable NFPA standards for design criteria for the sprinkler system.

A-6.5.1.5. 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. The Alberta Building Code 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 Alberta Building Code specified 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 this Code ensures that the conditions specified in the Alberta Building Code, 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, proper weight individual ceiling tiles in suspended ceilings and the integrity of fire protective covering construction are maintained.

A-6.5.2.4. The manner in which closed sprinkler control valves are identified should also be apparent to the responding fire department.

A-6.5.3.6. Velocities of approximately 3 m/s can be achieved by attaining flow rates as indicated in Table A-6.5.3.6.

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 during subsequent main drain tests, the supply system should be investigated for the possibility of closed valves or other obstructions in the piping.

Table A-6.5.3.6.
Forming Part of 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
Column 1	2

A-6.5.4.4. 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 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. 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. 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 the 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 shutoff 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-6.6.4.6. 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-6.7.1.5. This may be achieved by replenishment as the result of the normal weekly test programme required in Article 6.7.1.1.

A-6.9.1.1. Senior Technical Officer, Fire Code Interpretation 92-FCI-002, "Guidelines for Fire Hose Couplings and Fittings," is considered the criteria necessary to ensure fire departments, municipal officials and industry maintain the existing levels of standardization of threaded fire hose couplings and fittings.

A-7.2.1.1. It is not intended that all equipment be tested on each 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. In practice, many buildings have a smoke control measure that does not exactly follow one explicit measure as listed in the Supplement to the Alberta Building Code. The only way to ensure that the building occupants know how the system works and what it consists of, is to have a detailed record that lists all features of the system. Since many of the smoke control features are never used except in a fire situation, all devices must be listed to ensure that they are tested on a regular basis.

Chapter 3 of the Supplement to the Alberta Building Code may be an essential reference source when conducting an audit of the system installed in an existing building. In new construction, the owner should ensure that the designers provide him with all the relevant information.

A-7.3.1.3. 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.

Appendix B
SAFETY CODES ACT
CHAPTER S-0.5

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;

(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 plat-form 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, municipal district or county,

(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;

(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, 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.

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.

Crown bound

3 The Crown is bound by this Act.

PART 1
RESPONSIBILITIES

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.

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.

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.

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.

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.

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.

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.

(2) Compliance with a variance is deemed to be compliance with this Act.

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.

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 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 and an accredited municipality 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 that engages 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.

PART 2
ADMINISTRATION

Overall administration

13(1) The Minister administers this Act but an accredited municipality and an accredited corporation shall provide for the administration of this Act in accordance with the order that designated it as an accredited municipality or corporation.

(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.

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 Administer in exercising the powers and performing the duties of an Administrator.

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.

Safety Codes Council

Council

16(1) There is hereby established a corporation to be known as the "Safety Codes Council" consisting of the members appointed by the Minister.

(2) Among the persons appointed to the Council the Minister 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 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.

Payment to Council members

17 The members of the Council may be paid, at the rates prescribed by the Minister,

(a) remuneration for the performance of their duties as members of the Council, and

(b) travelling and living expenses while away from their ordinary places of residence in the course of their duties as members of the Council.

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,

(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.

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.

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.

Money

21(1) The Council, subject to the approval of the Lieutenant Governor in Council and 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,

(a) be invested in investments in which trustees are authorized to invest trust money under the *Trustee Act*, and

(b) with the consent of the Provincial Treasurer, be deposited in the Consolidated Cash Investment Trust Fund.

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.

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.

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.

(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.

Accreditation overlap

25(1) If an accredited municipality 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 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.

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 this 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.

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.

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.

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.

(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.

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 discon-

nection 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.

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.

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).

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 or accredited municipality 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 support shall be served not less than 3 days before the day named in the notice for hearing the application.

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.

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.

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 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, 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.

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.

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 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.

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.

Permit issues

40(1) On receipt of an application, a safety codes officer 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 may include terms and conditions in a permit.

(3) If a safety codes officer refuses to issue a permit, the safety codes officer 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.

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.

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.

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).

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 cir cumstances 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.

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.

(5) If an Administrator receives a request 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.

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 30 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 if the subject-matter of the order is administered by the accredited municipality, and the Council shall notify the Administrator, the accredited municipality and the appellant of the time and place of the appeal.

(3) An appeal may proceed under this section regardless of whether a request was made under section 45(5).

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.

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 and safety codes officer if they were sent a copy of the notice of appeal.

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 or an accredited municipality.

(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.

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.

Enforcement of order

51(1) A safety codes officer appointed under section 29(2), 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 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* has been given written notice of the intention of the accredited municipality to carry out the order.

(2) When an order is carried out under subsection (1), 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 Taxation Act* from the date the accredited municipality incurred the expenses, and that Act and the *Tax Recovery Act* apply to the enforcement, collection and recovery of the amount.

Enforcement of order

52(1) 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 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, 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 the order if the owner of the land concerned as registered under the *Land Titles Act* and the persons named under sub section (2) have been given written notice of the intention to carry out the order, unless the owner refuses to allow or interferes with the entry or the carrying out of 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 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 the owner of the land concerned as registered under the *Land Titles Act* and 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.

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 or the accredited municipality, 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.

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.

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 if the thing, process or activity is under the administration of the accredited municipality.

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.

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

(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.

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.

Release of Information

59(1) The Minister, members of the Council, Administrators, accredited municipalities, 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, or

(e) if the release of information or a document is authorized by this Act.

(2) A person may request a search of the information system for variances and outstanding orders.

PART 7 GENERAL

Fees

60(1) The Government and the Council may charge fees, in accordance with an order of the Minister respecting fees,

(a) for anything issued, or for any material, information, education program or service provided under this Act,

(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.

(2) The Minister may make orders respecting the payment of fees to witnesses and interpreters and for reporting fires.

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 both;

(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 the 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, corporations and 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, corporations or 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.

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 to carry out its powers and duties under the *Forest and Prairie Protection Act*.

(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.

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,

is guilty of an offence.

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 $2 000 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.

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.

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.

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.

Inspectors, local assistants

68*(1) On the coming into force of this Act, a person who is appointed as an inspector* local *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,

is deemed, in accordance with the regulations, to be appointed 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 desig nated 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.

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, or*

(f) *Boilers and Pressure Vessels Act,*

relating to matters regulated under this Act is deemed to be an accredited municipality with those powers and duties.

Consequential

70(1) *The Architects Act is amended*

(a) *in section 1(e) by striking out* "Uniform Building Standards Act" *and substituting* "Safety Codes Act";

(b) *in section 2*

(i) *in subsection (5) by striking out* "that is a building in a category or type of building described in the *Uniform Building Standards Act* as";

(ii) *in subsection (6) by striking out* "categories or types of";

(c) *in section 3(2) by striking out* "under the *Uniform Building Standards Act* in respect of a project for a building of a type described in section 5.4 of that Act" *and substituting* "authorized by the regulations under the *Safety Codes Act*";

(d) *in section 28(1) by striking out* "under the *Uniform Building Standards Act* for a building of a type described in section 5.4 of the *Uniform Building Standards Act*" *and substituting* "authorized by the regulations under the *Safety Codes Act*".

(2) *The Department of Public Works, Supply and Services Act is amended in section 22(3)(e) by striking out "Uniform Building Standards Act" and substituting "Safety Codes Act".*

(3) *The Engineering, Geological and Geophysical Professions Act is amended*

(a) *in section 2*

(i) *in subsection (6) by striking out* "that is a building in a category or type of building described in the *Uniform Building Standards Act* as";

(ii) *in subsection (7) by striking out* "categories or types of";

(b) *in section 37 by striking out* "under the *Uniform Building Standards Act* for a building of a type described in section 5.4 of the *Uniform Building Standards Act*" *and substituting* "authorized by the regulations under the *Safety Codes Act*".

(4) *The Individual's Rights Protection Act is amended in section 5 by striking out "Uniform Building Standards Act" and substituting "Safety Codes Act".*

(5) *The Legislative Assembly Act is amended in Part 3 of the Schedule by striking out* "Board of examiners under the Electrical Protection Act, Board of examiners under the Gas Protection Act" *and by adding* "Safety Codes Council under the Safety Codes Act" *before* "School Buildings Board".

(6) *The Licensing of Trades and Businesses Act is amended in section 2(b) by striking out "Boilers and Pressure Vessels Act".*

(7) *The Liquor Control Act is amended in section 48(2)(c) by striking out* "the *Uniform Building Standards Act*, the *Fire Prevention Act*, the regulations under those Acts" *and substituting* "the *Safety Codes Act*, the regulations under that Act".

(8) *The Liquor Control Act is amended in section 49(1)*

(a) *in clause (c)(ii) by striking out "Uniform Building Standards Act* or the fire commissioner or an inspector under the *Fire Prevention Act" and substituting "Safety Codes Act";*

(b) *in clause (d) by striking out "Uniform Building Standards Act*, the *Fire Prevention Act* and the regulations under those Acts" *and substituting "Safety Codes Act*, the regulations under that Act".

(9) *The Municipal Government Act is amended in section 159 by repealing clauses (a) and (h) to (m).*

(10) *The Pipeline Act is amended in section 2(f) by striking out "Boilers and Pressure Vessels Act" and substituting* "definitions under the *Safety Codes Act*".

(11) *The Universities Act is amended in section 50*

(a) *in subsection (1) by striking out* "The provisions" *and substituting* "Subject to subsection (3), the provisions";

(b) *by adding the following after subsection (2):*

(3) The *Safety Codes Act* and the regulations under it, including any code adopted under that Act, apply to the use and development of any real property owned by or leased to a university.

Repeals

71(1) *The Fire Prevention Act is repealed.*

(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.*

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.*

(NOTE: Section 34 of the Liquor Control Amendment Act, 1991 proclaimed in force July 1, 1991.)

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CONVERSION FACTORS		
To Convert	**To**	**Multiply by**
m	ft	3.281
m^2	ft^2	10.76
m^3	ft^3	35.31
mm	in.	0.0394
L	gal (imp.)	0.2200
°C	°F	1.8 and add 32
kg	lb	2.205
kPa	lbf/in^2 (psi)	0.1450
L/m^2	gal/ft^2	0.0204
L/s	gal/min (gpm)	13.1982
m^3/h	ft^3/min (cfm)	0.5886
m^3/L	ft^3/gal	160.5440
m/s	ft/min	196.8
N	lbf	0.2248