



Continuing Education for Fire Inspectors 101

MODULE ONE Types of Occupancies

A large red square graphic on the left side of the slide.

A photograph of a two-story red brick building with white trim and a balcony, identified as the Downtown Hotel. The building has multiple windows and a sign that reads "DOWNTOWN HOTEL".

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The FireWise Consulting & Learning Academy logo, featuring a flame icon and the text "FireWise CONSULTING & LEARNING ACADEMY".

A large, stylized flame graphic in white, positioned on the right side of the slide.

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Welcome

Welcome to our continuing education course tailored for fire inspectors, where you not only expand your knowledge but also earn valuable credit hours. The goal of this course is to offer ongoing education for fire inspectors seeking to acquire new insights and reinforce their existing knowledge. Each module is bite-sized, designed to seamlessly integrate into a self-paced course. In this first module, we will look at Occupancy Classifications which have recently changed with the 2020 National Building Code.

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Agenda

In this part we will discuss:

- Why occupancy classifications are important
- Changes to occupancy classification in the 2020 National Building Code
- Fire separation between occupancy classifications, and
- Changing an occupancy classification in an existing building

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Occupancy classifications

Occupancy classification is the formal designation of the primary purpose of the building, structure or portion thereof. Structures are classified in one or more classification groups based on the hazards and risks to the building and occupants created by using the building. For example, you would not want a high hazard industrial operation like a distillery or drug manufacturing process taking place in the mixed-use building shown in this photo.

An occupancy classification must be assigned to every building or significant space within a building and should be the first thing determined in the design or change of use process since virtually every building code and regulation is based in part on the use of the building. The occupancy classification must be known, to determine the building code requirements for the structure.

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NBC classifications

In Canada, the Building Code identifies every building alphabetically by an occupancy classification from A to G based on its intended use. Group's A, B and F are further divided into subgroups:

Group A Division 1, 2, 3, 4

Group B Division 1, 2, 3, 4

Group F Division 1, 2 and 3, as can be seen in this chart.

The 2020 NBC adds several new classifications Group B4 Home type care occupancies and Group G 1 through 4 which deals with Agricultural occupancies.

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Group A and Group B classifications

Group A buildings are for assembly use such as theatres, art galleries, pubs, restaurants, night clubs and even outdoor stadiums with bleachers.

Group B is for institutional use where there are contained use areas like prisons and mental institutions. Group B also includes hospitals and care facilities where people can have difficulty exiting the building on their own. The new Group B-4 provides for home-type care occupancies which is a growing use due to the aging population.

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Group C and Group D classifications

Group C is residential, like apartments, hotels, houses and places where lodging is offered.

Group D is business and personal services like doctors' offices, banks, insurance companies and beauty salons.

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Group E and Group F classifications

Group E are mercantile like shops, supermarkets and department stores.

Group F are industrial occupancies like bulk plants, fueling stations, repair garages and warehouses.

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Group B Division 4

New to Division A of the 2020 National Building Code is Group B Division 4 home-type care occupancies. This defines the use of a single detached housekeeping unit where care is provided to residents and may include the living space of the caregiver and their family. These code changes were instituted to reflect the evolving development of, and need for, smaller home-type care facilities in Canada.

Division A of the building code Appendix Note 1.4.1.2 says in part “*Support services rendered to the residents of a home-type care occupancy refer to services provided at a cost by caregivers who are responsible for the care for a period exceeding 24 consecutive hours. They do not refer to services provided by family members of the residents, or to services arranged directly by residents with outside agencies.*”

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Group B Division 4 (continued)

In the context of Group B-4 home-type care occupancies, these services may include a daily assessment of the resident's functioning, awareness of their whereabouts, the making of appointments for residents and reminding them of those appointments, the ability and readiness to intervene if a crisis arises for a resident, supervision in areas of nutrition or medication, and provision of transient medical services. Services may also include activities of daily living such as bathing, dressing, feeding, and assistance in the use of washroom facilities, etc.

Section 9.10.2.2. of the building code addresses the requirements for Home-Type Care Occupancies. This section says in part, sleeping accommodations must be limited to not more than 10 people and the building must comply with Part 9 of the code. If there is accommodation for more than 10 people, the applicable requirements relating to care occupancies in Part 3 of the code apply.

Slide 1.9**New occupancy groups**

The 2020 fire code has a new sentence 2.1.3.3.(1), that requires smoke alarms to be installed in each home-type care occupancy and dwelling unit, except where the building has an approved residential fire warning system installed.

New sentence 6.7.1.1.(3) of the 2020 fire code requires the inspection, testing, and maintenance of residential fire warning systems to be in conformance with the CAN/ULC-S540 Standard for Residential Fire and Life Safety Warning Systems.

This standard provides the minimum requirements for the design, installation, inspection, testing, and maintenance of residential fire warning systems for use within dwelling units and care occupancies not requiring a full fire alarm system. It applies to both required and voluntary residential fire warning system installations. It specifies how residential fire warning systems shall be installed to perform their intended functions.

The fire code also requires portable extinguishers to be installed in home-type care occupancies.

Slide 1.10**Group B Division 4**

With some exceptions, the building must be sprinklered in conformance with NFPA 13D (2019 Edition) and must have a 30-minute water supply.

There are also new requirements for home-type care in the 2020 National Fire Code as well. Part 2 is entitled Building and Occupant Fire Safety and addresses the need for emergency planning, fire safety plans, supervisory staff, and smoke alarms.

Although the provisions for home-type care facilities are new to the 2020 NBC and NFC not all Canadian jurisdictions are adopting them. BC for example, has determined that further analysis about sprinkler system requirements is needed prior to the adoption of the Group B, Division 4 (Home-Type Care Occupancy) in BC. A complete copy of their Notification regarding the adoption of Group B Division 4 can be found in the Materials section of this module.

Slide 1.11**Group G, Farm Buildings**

A new Division B Part 2 has been added to the 2020 National Building to introduce technical requirements for farm buildings. This section has not been adopted by all Provinces and Territories but where it is not, Alberta for example, it can certainly be used as a best practice.

There are no complete statistics on farm fires in Canada, but insurance records and reports show that as Canadian farms increase in size, so too does the severity of fire losses in the agricultural sector. The insurance experience indicates that the frequency of farm fires is down, but severity is up. In Ontario for example there were 180 barn fires in 2008, which dropped to just over 140 in 2017.

In 2021 Ontario experienced 152 barn fires and recorded damages of just over \$54 million, according to the most current statistics from the Ontario Fire Marshal's Office.

Slide 1.12**Group G, Farm Buildings**

So, the severity of fire losses on farms has increased just by the nature of the increased values and size of holdings. It's not uncommon to have a dairy barn, with the cows, the barn, milking equipment, feed equipment, and the business insurance all encapsulated to be upwards of 10 million dollars in value.

Farm buildings are now defined in Article 1.4.1.2. of Division A of the 2020 National Fire Code. These include but are not limited to, produce storage and packing facilities, livestock and poultry housing, milking centres, manure storage facilities, grain bins, silos, feed preparation centres, farm workshops, greenhouses, farm retail centres, and horse riding, exercise, and training facilities.

Slide 1.13**Group G, Farm Buildings**

The new requirements for farm buildings include those related to fire protection and occupant safety, structural loads, processes and operations carried out within a building, and requirements regulating the farm building's HVAC system.

The new requirements have been added to the National Codes because farm buildings have distinct characteristics compared to other types of buildings: they have low occupant loads, they are typically located in rural settings, and they include unique activities and contents.

Slide 1.14**Group G, Farm Buildings**

Farm buildings may be classified as low or high human occupancy, depending on the occupant load.

Low human occupancy, have an occupant load of not more than 1 person per 40 m² of floor area. Examples of farm buildings with low human occupancy are livestock and poultry housing, manure and machinery storage facilities and horse exercise and training facilities where no bleachers or viewing areas are provided.

Examples of farm buildings classified as high human occupancy meaning more than 1 person per 40 square meters, include farm retail centres for feeds, horticultural and livestock produce, auction barns, and show areas where bleachers or other public facilities are provided. Farm work centres where the number of workers frequently exceeds the limit for low human occupancy will also be in this category. It is possible to have areas of both high and low human occupancy in the same building provided that the structural safety and fire separation requirements for high human occupancy are met in the part designated as high human occupancy.

Slide 1.15**Group G, Division 1**

Group G, Division 1 is High-hazard agricultural occupancy which means an agricultural occupancy containing sufficient quantities of highly combustible, flammable, or explosive materials which, because of their inherent characteristics, constitute a special fire hazard.

Examples of High Hazard Agricultural Occupancies include:

- farm buildings housing livestock with a below-floor storage area for liquid manure,
- feed mills,
- grain elevators,
- rooms for the bulk storage of dangerous goods classified as flammable gases or compressed gases,
- rooms for the bulk storage of flammable liquids, and
- rooms for the bulk storage of reactive materials.

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Group G, Division 2

Group G Division 2 includes agricultural Occupancies that are not elsewhere classified such as:

- animal exercise facilities,
- animal housing facilities,
- facilities for livestock or alternative livestock and game animals,
- facilities for fur-bearing animals or cultured fish and shellfish,
- animal training facilities,
- facilities for the packaging and processing of agricultural products,
- facilities for the production of plants and fungi (excluding greenhouses),
- farm workshops,
- feed preparation and storage facilities,
- fruit and vegetable storage facilities,
- grain, forage, and feed structures,
- milking facilities, and
- storage facilities for farming equipment and machinery facilities.

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Group G, Division 3 & 4

The Building Code defines Group G Division 3 Greenhouse Agricultural Occupancies as agricultural occupancies where plants are grown in a building or part thereof, that is primarily constructed of roofs and walls designed to transmit natural light. Group G Division 3 is exclusive to greenhouses.

The Building Code defines Group G Division 4 Agricultural Occupancies with no human occupants as occupancies that are not intended to be occupied by people under normal use and are generally used for the storage of agricultural materials and by-products.

Examples include:

- Biomass facilities,
- by-product facilities,
- digesters,
- grain bins,
- horizontal silos,
- storage bins, and
- vertical silos.

Slide 1.18**Group G, Division B**

There is a lot of new information and requirements in Division B Farm Buildings in the 2020 National Building Code.

Part 2 is concerned with the fire, structural, heating, ventilating and air-conditioning performance of farm buildings, as well as processes and operations carried out therein that involve a risk of explosion, high flammability or related conditions that create a hazard to life safety.

Part 2 of Division B addresses such things as:

- Non-agricultural Major Occupancies
- Environmental conditions
- Fire separation of occupancies
- Flame spread ratings
- Fire alarm and detection systems and
- Section 2.2.4 deals with Provisions for firefighting including sprinkler systems, portable extinguishers, emergency lighting, means of egress, and exits.

Slide 1.19**Group G Fire separation**

There is a new table in the building code that shows the fire separation requirements between Group G Major Occupancies and other major occupancies. It is important to read the notes that accompany the separation table as additional conditions may apply. For example, article 2.2.1.2 is entitled Prohibition of Occupancy Classifications. It says in part, Buildings classified as a Group G, Division 1 or 4 major occupancy shall not contain Group A, B, or C occupancies.

Article 2.2.1.9. contains requirements for other fire separations that are in addition to the requirements for the separation of major occupancies.

If you have farm buildings in your jurisdiction you should be familiar with Division B Part 2 of the National Building Code even if this section has not been adopted in your jurisdiction as it provides valuable information that may be referenced as a best practice. The appendix Notes to Part 2 also provides valuable information.

Slide 1.20**NFC structure**

In this course we have talked about several changes and additions to the 2020 editions of the fire and building codes. Fire inspectors should always check the applicable code reference even if they think they know what the code says. This is especially important when a new edition of a code or standard is implemented, particularly when addressing a significant fire and life safety deficiency or when dealing with an issue involving substantial property alteration, repair, or replacement which affects the property owner or occupier.

To assist code users to identify technical changes or revisions from the 2015 edition to the 2020 edition changes are highlighted by a vertical line in the margin as shown in this photo. No indication is given for editorial revisions or for renumbered or deleted content.

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NFC reference

Make sure when you are quoting something from the code that you use the correct reference number.

A consistent numbering system has been used throughout the National Model Codes as seen here. 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. The detailed provisions are often found at the sentence level (indicated by numbers in brackets), and sentences may be broken down into Clauses and Subclauses.

Information on the numbering system can be found in the Preface to the fire code under Additional Information.

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NFC terminology

It is important to use correct terminology to ensure that your message is clear and precise. It reduces the risk of misinterpretation or confusion among listeners or readers, helping them understand the information accurately. Employing accurate terminology demonstrates professionalism and expertise in the subject matter. It enhances your credibility and reinforces the idea that you are knowledgeable and competent in your field.

A common mistake in terminology is confusing the terms smoke alarm and smoke detector. Smoke alarm is a defined term in both the fire and building codes. Smoke alarm means a combined smoke detection and audible alarm device designed to sound an alarm within the room or suite in which it is located.

Smoke detector is not a defined term in the fire code, but it is in the building code and means “a fire detector designed to operate when the concentration of airborne combustion products exceeds a predetermined level.” Smoke detectors initiate a signal to the fire alarm system but do not have a built-in audible alarm.

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Let's Review

In this course, we discussed:

- That occupancy classification is the formal designation of the primary purpose of the building
- That an occupancy classification must be assigned to every building or significant space within a building
- Occupancy classifications are alphabetical from Group A through Group F
- Group A is Assembly and there are 4 categories
- Group B is institutional and there are 4 categories
- Group B-4 is a new classification that applies to Home-type care occupancies
- Group C is Residential
- Group D is Business and Personal Services
- Group E is Mercantile
- Group F is Industrial with three sub-groups F-1 High Hazard, F-2 Medium Hazard and F-3 is Low Hazard

- Group G is a new classification found in Part 2 of Division B in the National Building Code that deals with Farm Buildings
- The sub-groups Group G are Divisions 1 through 4
- Division 1 is High Hazard Agricultural occupancies
- Division 2 is Agriculture building not elsewhere classified
- Division 3 is Greenhouses
- Division 4 is Agriculture occupancies with no human occupants
- Alberta has not included Farm Buildings in their fire code, but it can still be referenced as a best practice.
- We looked at the building code requirements for fire separation between occupancy classifications.
- The compatibility between occupancies like the fact that the building code does not permit a Group F Division 1 High hazard industrial occupancies or Group G Division 1 or 4 to be contained in a building with Group A, B or C occupancies.