

EXISTING FIRE ALARM SYSTEMS

PURPOSE

This identifies requirements where an existing fire alarm system, regardless of age, requires inspection, testing, maintenance and installation of devices or other equipment (e.g. maglocks) in order to provide or maintain an expected level of safety for occupants.

This also defines who is able to install, verify, inspect, test and maintain fire alarm systems.

DISCUSSION

There are five types of activities conducted on a fire alarm system – installation, verification, inspection, testing and maintenance.

Installation includes a new install or additions, modifications and renovations (changes) to an existing installation.

Verification involves inspection and testing to verify the fire alarm system conforms to the design, and the applicable codes and standards, and performs all of its intended functions.

Inspection is a visual examination to determine the device or system will apparently perform in accordance with its intended function.

Testing is the operation of a device or system to determine it will perform in accordance with its intended operation or function.

Maintenance is the removal, replacement or servicing of devices or equipment found inoperative during an inspection and test of the fire alarm system or due to an inoperative device at any other time.

There are factors that influence the degree of work that may be necessary to an existing fire alarm system in order for it to provide the expected level of protection. The factors take into consideration the need for maintaining or changing systems that have been installed to “good engineering practice” prior to established codes and standards.

The factors also reflect how fire alarm systems installed under established codes and standards should be regarded when maintenance or changes are contemplated and to what degree the

Issuance of this STANDATA is authorized by
the Provincial Fire/Building and Electrical Administrators
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requirements of the most current codes and standards apply in maintenance and changes to the systems.

The main codes containing specific requirements are the National Building Code–2019 Alberta Edition (NBC(AE)), National Fire Code–2019 Alberta Edition (NFC(AE)) and the Canadian Electrical Code (CE Code) 2018. These codes reference the following standards for the installation, verification, inspection and testing of fire alarm systems:

- CAN/ULC-S524-14 Installation of Fire Alarm Systems
- CAN/ULC-S536-13 Inspection and Testing of Fire Alarm
- CAN/ULC-S537-13 Verification of Fire Alarm Systems
- CAN/ULC-S1001-11 Integrated Systems Testing of Fire Protection and Life Safety Systems

Installations, verifications, inspections, testing and maintenance of fire alarm and voice communication systems can only be completed by those qualified under Division C of the NFC(AE).

CODE REFERENCES

Safety Codes Act states:

Interpretation
1(1) In this Act,
 (e) “Administrator” means an Administrator appointed under this Act;

Application of Act
2(1) This Act applies to fire protection, barrier-free design and the design, manufacture, construction, installation, use, operation, occupancy and maintenance of

- a) buildings,
- b) electrical systems,
- c) elevating devices,
- d) gas systems,
- e) plumbing systems,
- f) pressure equipment, and
- g) private sewage disposal systems.

NBC(AE) and NFC(AE) Preface states:

Relationship between the NBC(AE) and the NFC(AE)
 The National Building Code – 2019 Alberta Edition (NBC(AE)) and National Fire Code – 2019 Alberta Edition (NFC(AE)) each contain provisions that deal with the safety of persons in buildings in the event of a fire and the protection of buildings from the effects of fire.(2) These two Codes are developed as complementary and coordinated documents to minimize the possibility of their containing conflicting provisions. It is expected that buildings comply with both the NBC(AE) and the NFC(AE). The NBC(AE) generally applies at the time of construction and reconstruction while the NFC(AE) applies to the operation and maintenance of the fire-related features of buildings in use.
 The scope of each of these Codes with respect to fire safety and fire protection can be summarized as follows:
 The NBC(AE) covers the fire safety and fire protection features that are required to be incorporated in a building or facility at the time of its original construction. Building codes typically no longer apply once a building is occupied, unless the building is undergoing alteration or change of use, or being demolished.

The NFC(AE) includes provisions for:

- the on-going maintenance and use of the fire safety and fire protection features incorporated in buildings
- the conduct of activities that might cause fire hazards in and around buildings
- limitations on hazardous contents in and around buildings
- the establishment of fire safety plans
- fire safety at construction and demolition sites

In addition, the NFC(AE) contains provisions regarding fire safety and fire protection features that must be added to existing buildings when certain hazardous activities or processes are introduced in these buildings.

Some of the NFC(AE)'s provisions are not duplicated directly in the NBC(AE) but are in fact adopted through cross-references to the NFC(AE). Thus, some NFC(AE) provisions may apply to original construction, alterations, or changes in use.

NBC(AE) and NFC(AE) Article 1.4.1.2 of Division A states:

1.4.1.2. Defined Terms

Approved means acceptable to the *Provincial Fire Administrator*.

Authority having jurisdiction means a safety codes officer in the building discipline exercising authority pursuant to designation of powers and terms of employment in accordance with the Safety Codes Act.

Authority having jurisdiction means a safety codes officer in the fire discipline exercising authority pursuant to designation of powers and terms of employment in accordance with the Safety Codes Act. (See Note A-1.4.1.2.(1)).

A-1.4.1.2.(1) Defined Terms. Authority Having Jurisdiction

The defined term “authority having jurisdiction” refers to a safety codes officer as the appointed individual responsible for decision-making in a number of areas. In most cases, this individual will be a member of an accredited municipal fire department. In municipalities that use accredited agencies for their inspection and enforcement, the fire department may not be involved. It is important that accredited municipalities employing accredited agencies properly designate the person(s) acting as the authority having jurisdiction.

In addition, municipalities using accredited agencies should ensure that the agency has a close working relationship with the fire department during the decision-making process.

Provincial Building Administrator means a person in the building discipline appointed as an Administrator under the Safety Codes Act.

Provincial Fire Administrator means a person in the fire discipline appointed as an Administrator under the Safety Codes Act.

Registered engineering professional means an individual who is authorized to engage in the practice of engineering under the Engineering and Geoscience Professions Act and its Regulations.

NBC(AE) Article 1.1.1.2. of Division A states:

1.1.1.2. Application to Existing Buildings

(See Note A-1.1.1.2.)

- 1) This Article applies to a *building* that has been legally built, occupied and used before 01 April 2019.

- 2) If a *building* is altered, rehabilitated, refurbished, renovated or repaired, the level of life safety and *building* performance shall not be decreased.
- 3) Except as specified in Part 10 of Division B, the *authority having jurisdiction* shall accept any construction or condition that lawfully existed in Alberta before 01 April 2019 if the construction or condition does not constitute an *unsafe condition*.
- 4) A change in *occupancy* or *alteration* of any *building* constructed before 01 April 2019 shall be permitted if the level of safety and *building* performance proposed are acceptable to the *authority having jurisdiction*.
- 5) For a *building* constructed before 01 April 2019, the *authority having jurisdiction* may accept an alternative or a proposal that achieves the appropriate level of safety for the specific activity for which the *building* is to be used.
- 6) The *authority having jurisdiction* may accept existing construction not in complete compliance with this Code, in which case it may be accepted, subject to conditions.

A-1.1.1.2. Application to Existing Buildings. This Code is most often applied to existing or relocated buildings when an owner wishes to rehabilitate a building, change its use, or build an addition, or when an enforcement authority decrees that a building or class of buildings be altered for reasons of public safety. It is not intended that the NBC(AE) be used to enforce the retrospective application of new requirements to existing buildings or existing portions of relocated buildings. For example, although the NFC(AE) could be interpreted to require the installation of fire alarm, standpipe and hose, and automatic sprinkler systems in an existing building for which there were no requirements at the time of construction, it is the intent of the Safety Codes Council that the NFC(AE) not be applied in this manner to these buildings unless the authority having jurisdiction has determined that there is an inherent threat to occupant safety and has issued an order to eliminate the unsafe condition, or where substantial changes or additions are being made to an existing building or the occupancy has been changed. (See also Note A-1.1.1.1.(1) of Division A of the NFC(AE).)

Relocated buildings that have been in use in another location for a number of years can be considered as existing buildings, in part, and the same analytical process can be applied as for existing buildings. It should be noted, however, that a change in occupancy may affect some requirements (e.g. loads and fire separations) and relocation to an area with different wind, snow or earthquake loads will require the application of current code requirements. Depending on the construction of the building and the changes in load, structural modifications may be required. Similarly, parts of a relocated or existing building that are reconstructed, such as foundations and basements, or parts being modified are required to be built to current codes. Whatever the reason, Code application to existing or relocated buildings requires careful consideration of the level of safety needed for that building. This consideration involves an analytical process similar to that required to assess alternative design proposals for new construction. See Clause 1.2.1.1.(1)(b) for information on achieving compliance with the Code using alternative solutions.

In developing Code requirements for new buildings, consideration has been given to the cost they impose on a design in relation to the perceived benefits in terms of safety. The former is definable; the latter difficult to establish on a quantitative basis. In applying the Code requirements to an existing building, the benefits derived are the same as in new buildings. On the other hand, the increased cost of implementing in an existing building a design solution that would normally be intended for a new building may be prohibitive.

The successful application of Code requirements to existing construction becomes a matter of balancing the cost of implementing a requirement with the relative importance of that requirement to the overall Code objectives. The degree to which any particular requirement can be relaxed without affecting the intended level of safety of the Code requires considerable judgment on the part of both the designer and the authority having jurisdiction.

Further information on the application of Code requirements to existing or relocated buildings may be found in the following publications:

- “User’s Guide - NBC 1995, Fire Protection, Occupant Safety and Accessibility (Part 3)”
- “Guidelines for Application of Part 3 of the National Building Code of Canada to Existing Buildings”
- Commentary entitled “Application of NBC Part 4 of Division B for the Structural Evaluation and Upgrading of Existing Buildings” of the “Structural Commentaries (User’s Guide – NBC 2015: Part 4 of Division B)”
- “User’s Guide - NBC 1995, Application of Part 9 to Existing Buildings”
- CBD 230, “Applying Building Codes to Existing Buildings”

These publications can be ordered through NRC’s website.

NBC(AE) Article 3.2.4.5. of Division B states:

3.2.4.5. Installation and Verification of Fire Alarm Systems

- 1) Except as permitted by Articles 3.2.4.10. and 3.2.4.19., fire alarm systems, including the voice communication capability where provided, shall be installed in conformance with CAN/ULC-S524, “Installation of Fire Alarm Systems.”
- 2) Fire alarm systems shall be verified in conformance with CAN/ULC-S537, “Verification of Fire Alarm Systems,” to ensure they are operating satisfactorily.

NBC(AE) Article 2.4.2.4. of Division C states:

2.4.2.4. Fire Alarm System Designs

- 1) If a fire alarm system is to be installed in a *building* described in Sentence 2.4.2.1.(4) or (5), the *owner* shall submit evidence to the *authority having jurisdiction*, before construction begins, that they have retained a *registered engineering professional* to
 - a) design the system,
 - b) perform *field reviews* of the system during installation, and
 - c) witness verification of the system after installation.

NFC(AE) Article 2.1.1.1. of Division A states:

2.1.1.1. Application

- 1) This Part applies to all *buildings* and facilities covered in this Code. (See Article 1.1.1.1.)

NFC(AE) Article 6.1.1.1 of Division B states:

6.1.1.1. Application

- 1) This Part includes requirements for the inspection, testing, maintenance, and operation of portable extinguishers, water-based fire protection systems, special extinguishing systems, fire alarm systems,

NFC(AE) Sentence 6.3.1.2.(1) of Division B states:

6.3.1.2. Inspection and Testing

- 1) Fire alarm systems shall be inspected and tested in conformance with CAN/ULC-S536, “Inspection and Testing of Fire Alarm Systems.”

NFC(AE) Article 2.2.4.3. of Division C states:

2.2.4.3. Fire Alarm and Voice Communication Systems

- 1) Only qualified persons shall install, test or perform maintenance on fire alarm and voice communication systems when they have acquired an *approved* certificate of

training from

- a) a public post-secondary educational institution, or
- b) the Canadian Fire Alarm Association (CFAA).

(See Note A-2.2.4.3.(1).)

A-2.2.4.3.(1) The types of training provided and other provincial legislation may limit the scope of activities a qualified person may perform on such systems.

Persons are considered qualified to make operational, inspect, test and maintain fire alarm and voice communication systems when they have acquired a certificate of training in this area of study from

- a) a public post-secondary educational institution, including:
 - i) an Alberta Journeyman's Electrician certificate on or after September 1, 1991,
 - ii) an Alberta Journeyman's Electrician certificate prior to September 1, 1991 and a fire alarm course* recognized by the Provincial Fire Administrator,
 - iii) a Canadian Red Seal Journeyman's Electrician certificate and a fire alarm course* recognized by the Provincial Fire Administrator, or
- b) Fire Alarm Technician certification issued by the Canadian Fire Alarm Association (CFAA).

Persons are considered qualified in the installation of fire alarm and voice communication systems when they have acquired

- a) an Alberta Journeyman's Electrician certificate on or after September 1, 1991,
- b) an Alberta Journeyman's Electrician certificate prior to September 1, 1991 and have completed a fire alarm course* recognized by the Provincial Fire Administrator, or
- c) a Canadian Red Seal Journeyman's Electrician certificate and have completed a fire alarm course* recognized by the Provincial Fire Administrator.

Fire alarm verifications are generally the responsibility of a licensed engineering professional. In Alberta, this must be the registered professional who will complete a Schedule "C" under the National Building Code – 2019 Alberta Edition.

APPLICATION

This interpretation applies to all buildings where a fire alarm system is currently in use and the fire alarm undergoes installation (changes), verification, inspection, testing and maintenance.

INTERPRETATION

This interpretation will simplify the requirements for installation (changes), verification, inspection, testing and maintenance to fire alarm systems in existing buildings. Only those qualified as per the NFC(AE) can complete these types of activities.

The five types of activities that can be done on an existing fire alarm system include: installation (changes), verification, inspection, testing and maintenance. Maintenance is typically the removal and replacement of devices found inoperative during a regular annual inspection and test of the fire alarm system or due to an inoperative device at any other time. Qualified electricians and fire alarm technicians can complete this activity as per NFC(AE) Division C. Only qualified electricians can replace or repair wiring.

For fire alarm systems installed under previous Alberta editions of the building code, equal exchange (like for like device replacement) of devices are acceptable. However, if the replacement is not an equal exchange, the following scenarios shall be followed:

- Change of use or modernization of the building - the current NBC(AE) shall be applied.

- No change of use – in this situation, upgrading to the current Building Code could be onerous and according to NFC(AE) Division A, Article 1.1.1.2. the owner may apply to the *authority having jurisdiction* (AHJ) (Building) for an alternative solution detailing the reasons why they need a fire alarm replaced and why they want to install a new fire alarm to an older edition of the Alberta Building Code and/or CAN/ULC standard.

Note: Where the NBC(AE) requires professional involvement for a building due to its size, occupancy, or complexity, a registered engineering professional is also required to upgrade or modify existing fire alarm systems.

If a fire alarm system requires additions or modifications, these changes are still categorized as installs and, along with complete new installs, can only be completed by a qualified electrician. The following chart shows the work which an electrician or fire alarm technician can complete:

Work Acceptable Under the Electrician Trade Regulation and the NFC(AE)

INSTALLATION & MAINTENANCE OF FIRE ALARM SYSTEMS		
	ELECTRICIAN	TECHNICIAN
Installation	✓	✘
Inspection	✓	✓
Testing	✓	✓
Maintenance	✓ (1)	✓ (1)
Additions / Renovations	✓	✘
Audit System (under AFC 6.3.1.6.)	✘ (2)	✘ (2)

- 1) Certified electricians and technicians must be qualified under the NFC(AE).
- 2) Certified electricians and technicians qualified as per the NFC(AE) may perform an audit where professional engineering involvement is not required as per the NBC(AE).

NOTES:

- a) Apprentice electricians may complete all of the work an electrician is able to, as long as the apprentice is competent to complete the work. The apprentice also has to be under the supervision of a journeyman electrician as per the Apprentice Program Regulation and the Electrician Trade Regulation.
- b) A CFAA Fire Alarm Trainee (a trainee is one that is actively enrolled within the CFAA fire alarm technician program) may complete all of the work a certified technician is able to, as long as they are competent to complete the work. The CFAA Fire Alarm Trainee also has to be under the supervision of a certified technician.
- c) Where the table indicates inspections can only be completed by a qualified person, the daily and monthly inspections required by CAN/ULC–S536 are exceptions. These daily and monthly inspections and tests may be completed by the *owner* or the *owner’s* representative who have received training from the manufacturer or service provider on their system.

All additions or modifications to a fire alarm system must be reviewed and accepted by the Building *Authority Having Jurisdiction*. Permits are often required for modifications and additions to the fire alarm system. The Safety Codes Act – Permit Regulation sets out the requirements for permits under both the building and electrical disciplines. The local *Authority Having Jurisdiction* must be contacted prior to any work being conducted on any fire alarm system.

Fire alarm’s system verification must be in accordance with CAN/ULC S537 Verification of Fire Alarm Systems.

Please refer to STANDATA [19-BCI-014R1](#) Fire Alarm and Fire Suppression System Verification and Testing Certificates.

This INTERPRETATION replaces the following:
FCI-08-06 and 14-FCI-006R1 Existing Fire Alarm Systems.

This INTERPRETATION is applicable throughout the province of Alberta.