

EXISTING FIRE ALARM SYSTEMS

PURPOSE

The purpose of this bulletin is to identify requirements where a building 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 protection for occupants.

In addition, this bulletin will define who is able to inspect, test, maintain and install fire alarm systems.

DISCUSSION

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

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

Testing is the operation of a device or system to determine that 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.

Installation includes a new install or additions, modifications and renovations (changes).

There are factors that influence the degree of work that may be necessary to a building 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 had 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 requirements of the most current codes and standards apply in maintenance and changes to the systems.

Aside from the specific requirements of the Alberta Building Code 2014 (ABC 2014), Alberta Fire Code 2014 (AFC 2014) and the Canadian Electrical Code 2018.

The main referenced standards for the installation, verification, inspection and testing of fire alarm systems are:

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

Unless stated otherwise, all Code references in this STANDATA are to Division B of the Alberta Fire Code 2014.

Issue of this STANDATA is authorized by
the Provincial Fire and Electrical Administrator

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Installations, inspections, testing and maintenance of fire alarm and voice communication systems can only be completed by those recognized as qualified to do so under Division C of the AFC 2014.

CODE REFERENCES

ABC 2014, Article 3.2.4.5. states:

3.2.4.5. Installation and Verification of Fire Alarm Systems

- 1) Except as permitted by Articles 3.2.4.11. and 3.2.4.20., 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.

AFC 2014, Sentence 6.3.1.2.(1) 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."

ABC 2014 Division A, Article 1.1.1.2. states:

1.1.1.2. Application to Existing Buildings

(See Appendix A.)

- 1) This Article applies to a *building* that has been legally built, occupied and used before 01 May 2015.
- 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 May 2015 if the construction or condition does not constitute an *unsafe condition*.
- 4) A change in *occupancy* or *alteration* of any *building* constructed before 01 May 2015 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 May 2015, 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.

ABC 2014 Division A, Appendix A-1.1.1.2. states:

A-1.1.1.2. Application to Existing Buildings. This Code is most often applied to existing buildings when an owner wishes to rehabilitate a building, change its use, or build an addition, or when an enforcement authority decrees that a building or class of buildings be altered for reasons of public safety. It is not intended that the Alberta Building Code be used to enforce the retrospective application of new requirements to existing buildings or existing portions of relocated buildings. For example, although the Alberta Fire Code 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 Alberta Fire Code 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 Appendix Note A-1.1.1.1.(1) of Division A of the Alberta Fire Code.)

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) and its Appendix Note 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 L, Application of NBC Part 4 of Division B for the Structural Evaluation and Upgrading of existing Buildings" of the User's Guide - NBC 2010, Structural Commentaries (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 Client Services, NRC Construction, National Research Council of Canada, Ottawa, Ontario K1A 0R6, or through the Web site at www.nationalcodes.nrc.gc.ca.

AFC 2014, Division C, Article 2.2.4.3. 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 Appendix A.)

AFC 2014, Division C, Appendix A 2.2.4.3. states

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 Chief Fire Administrator,
 - (iii) a Canadian Red Seal Journeyman's Electrician certificate and a fire alarm course* recognized by the Chief Fire Administrator, or
- (b) Fire Alarm Technician certification issued by the Canadian Fire Alarm Association (CFAA) or the Northern & Southern Alberta Institutes of Technology.

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 Chief Fire Administrator, or
- (c) a Canadian Red Seal Journeyman's Electrician certificate and have completed a fire alarm course* recognized by the Chief 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 Alberta Building Code.

*Such courses include the Alberta Fire Alarm upgrading course and courses in this area offered by the International Brotherhood of Electrical Workers (IBEW).

APPLICATION

This interpretation applies to all existing buildings where a fire alarm system is currently in existence and the fire alarm undergoes inspections, testing, maintenance or installation (changes).

INTERPRETATION

This interpretation will simplify the requirements for inspections, testing, maintenance and installations (changes) to fire alarm systems in existing buildings. Only those qualified as per the AFC 2014 can complete these types of activities.

There are four types of activities that can be done on an existing fire alarm system – inspection, testing, maintenance and installation. Qualified electricians and fire alarm technicians can complete this activity. 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 AFC 2014 Division C. Only qualified electricians can replace or repair wiring.

If the replacement of a device is not of an equal exchange (like for like device replacement) in a fire alarm system installed under previous ABC editions, and the fire alarm system needs to be replaced, the following scenarios shall be followed:

- Change of use or modernization of the building - the current ABC shall be applied.
- No change of use – in this situation, upgrading to the current Code could be onerous and according to ABC 2014 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 ABC and/or CAN/ULC standard.

If a fire alarm system requires additions or modifications, then these changes are still categorized as installs and along with complete new installs, a qualified electrician can only do this work.

The following chart shows the work which an electrician or fire alarm technician can complete:

Work Acceptable Under the Electrician Trade Regulation and the Alberta Fire Code 2014

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 Alberta Fire Code to perform maintenance on fire alarm systems.

(2) Certified electricians and technicians qualified as per the Alberta Fire Code , may perform an audit where professional engineering involvement is not required as per the Alberta Building Code.

All additions or modifications to a fire alarm system must be reviewed and accepted by the AHJ (Building). 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 AHJ must be contacted prior to any work being conducted on any fire alarm system.

Fire alarm’s are to be verified in accordance with CAN/ULC S537 Verification of Fire Alarm Systems.

Note: Professional engineering involvement is necessary for the upgrading or modification of existing fire alarm systems where the size and occupancy of the building under the ABC 2014 determines professional involvement. Professional engineering involvement may include as little as preparing a scope of work for the building alarm system and a final verification after installation.

Please refer to STANDATA 14-BCI-009 Fire Alarm and Fire Suppression System Verification and Testing Certificates and STANDATA 14-BCB-005/14-FCB-004 Commissioning of Life Safety and Fire Protection Systems (Integrated Systems Testing).

This STANDATA replaces FCI-08-06 Existing Fire Alarm Systems.

This INTERPRETATION is applicable throughout the province of Alberta.