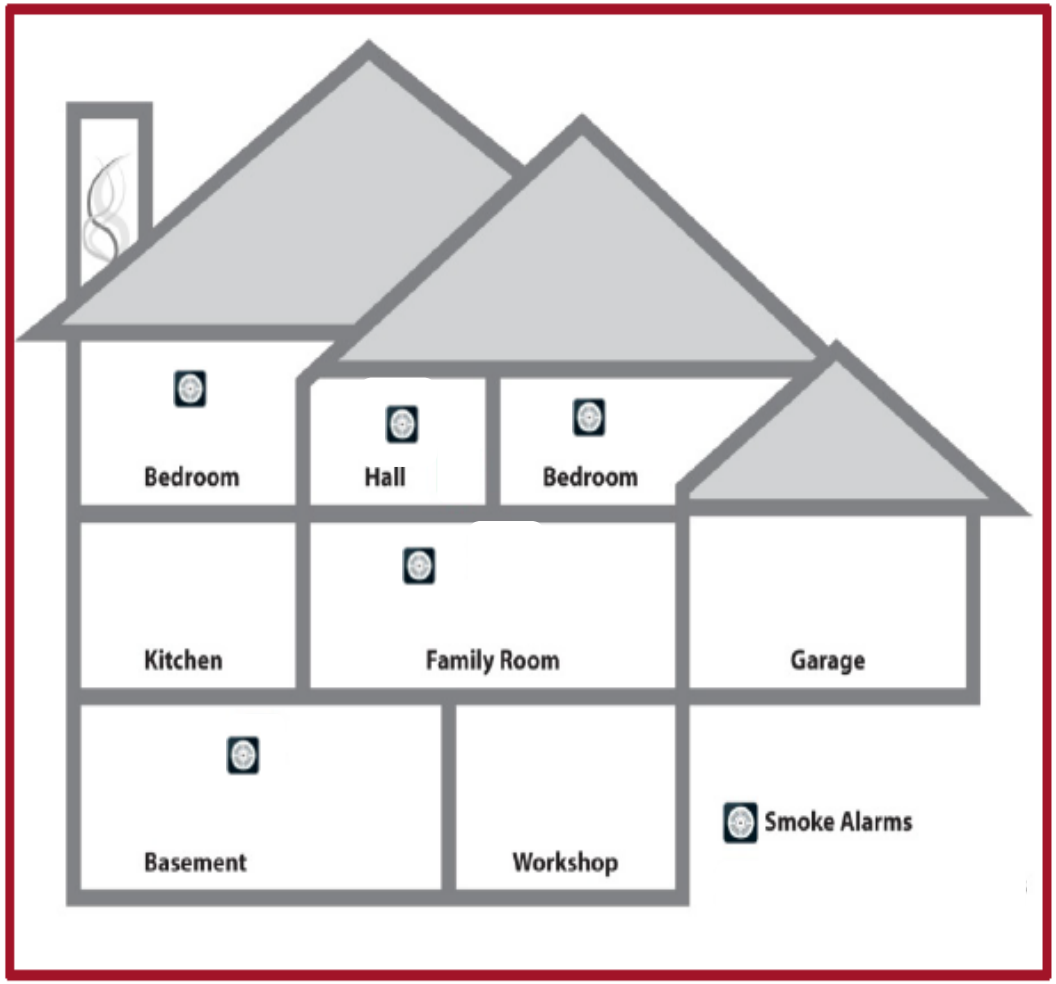
INSTALLATION OF SMOKE ALARMS

October 26, 2017



AGENDA

- Building Code Requirements
- Changes to the Smoke Alarm Standard
- Smoke Alarm Installation Standard
- ULC Programs

Building Code Requirements

1975 BUILDING CODE HISTORY

1975 – The Building Code - homes were required to have smoke alarms outside sleeping areas.

- Must be audible in bedrooms with door closed
- Have visual indication that they are operating

1975 BUILDING CODE HISTORY

Amended Part 3 in1977:

Single Station Alarm type shall be installed in every dwelling unit in apartment buildings

- Installed between each sleeping area and the remainder of the unit
- On the ceiling or walls between 6 and 12 inches below the ceiling
- Permanent connection to an electrical circuit and have no disconnect switch

1980 BUILDING CODE HISTORY

Part 3 (1980 and 1985 NBC)

- Conform to ULC-S531-1978 installed in dwelling units and in each sleeping room not in a dwelling unit.
- Where sleeping areas are served by hallways, smoke alarms shall be installed in hallways.
- Installed on or near ceilings in conformance with acceptable installation instructions.
- Interconnection of smoke alarms required.

1980 BUILDING CODE HISTORY

Part 9 (1980 and 1985 NBC)

- Conform to ULC-S531-1978 installed in dwelling units and in each sleeping room not in a dwelling unit.
- Installed on ceiling or walls between 150mm and 300mm below ceiling as per manufacturer installations instructions.
- Where no electrical power, can be battery operated.

1990 BUILDING CODE HISTORY

Changes to Part 9:

- Smoke alarms shall be provided on each floor level near the stairs connecting floor levels.

1995 BUILDING CODE HISTORY

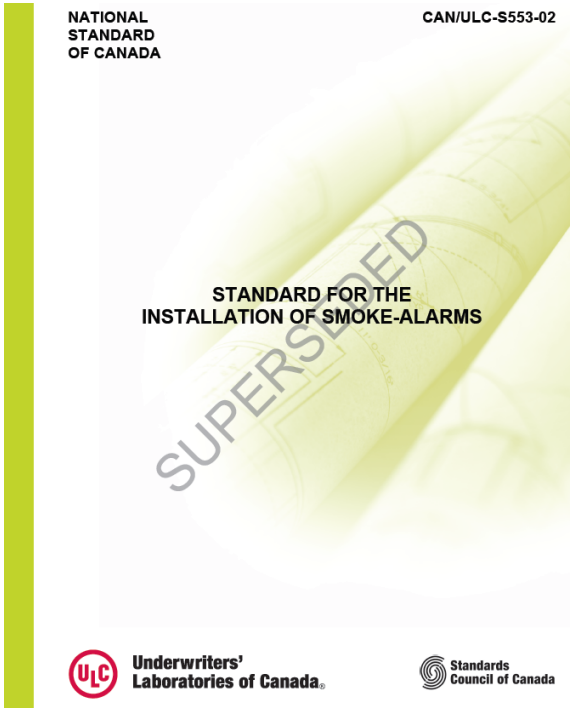
Part 9 Location of Smoke Alarms:

- At least one smoke alarm on each floor level, including basements.
- Each bedroom is protected either inside or if outside with 5m of the bedroom door.
- The distance from any point on a floor level to a smoke alarm on the same level does not exceed 15 m.
- A manually operated device is permitted within the circuitry of a smoke alarm to silence signal for 10 minutes.

2005 BUILDING CODE HISTORY

Additions to Part 3:

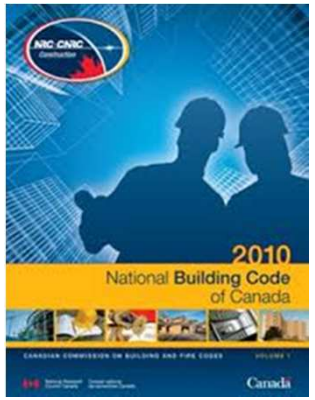
- Smoke Alarms shall be installed in conformance with CAN/ULC-S553, “Installation of Smoke Alarms”.
- The sound patterns of smoke alarms shall be significantly different from the temporal patterns of alarm signals.



2010 BUILDING CODE HISTORY

Part 3 and Part 9 changes

- Smoke alarm installed in each sleeping room plus still required between sleeping rooms/hallways.
- Battery must last for 7 days in normal condition followed by 4 min of alarm.
- Suites of residential occupancies permitted to have smoke detectors in lieu of smoke alarms.
- Alarm signal to meet temporal pattern or combination of temporal and voice



Other Regulations

MANITOBA REGULATION 31/2011

9.10.19.A.1. Heat Sensors required in Storage Garages

1) A fixed temperature heat sensor shall be installed in each *storage garage* that is within, part of or attached to, a *dwelling unit*.

2) A fixed temperature heat sensor required under Sentence (1) shall be

a) installed on the ceiling of the *storage garage* or, if the *storage garage* has no ceiling, on the bottom of a ceiling joist within the *storage garage*,

MANITOBA REGULATION 31/2011

b) installed by permanent connections to an electrical circuit and have no disconnect switch between the overcurrent device and sensor, and

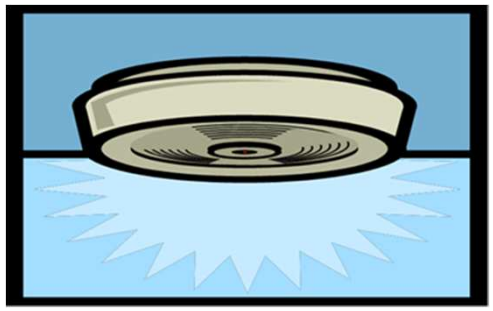
c) wired so that the activation of the sensor will cause all *smoke alarms* required to be within the *dwelling unit* under Articles 9.10.19.1. and 9.10.19.2. to sound.

HEALTH CANADA

Health Canada Santé Canada

Canada Consumer Product Safety Act

- Residential Detectors Regulations
  - Smoke Alarms must comply with CAN/ULC-S531 Standard for Smoke Alarms



CAN/ULC-S531 Smoke Alarms

CAN/ULC-S531 SMOKE ALARMS

Various editions starting with 1978, 1987, 2002, and current edition 2014

SMOKE ALARM TYPES

- Single Station Smoke Alarms
- Multiple Station Smoke Alarms

TYPES OF TECHNOLOGY

Ionization: Most effective in sensing small (invisible) smoke particles associated with flaming fires. (Paper burning or cooking fires)

- Operates by monitoring a small current created by ionized air between electrically charged plates. Smoke particles will reduce the current and alarm sounds.

Photoelectric: Most effective in sensing large and lighter colored smoke particles associated with smoldering fires.

- Operates by the scattering or obscuration of light caused by smoke particulars

MULTI-CRITERIA TECHNOLOGY

Dual Chamber

- Ionization/Photoelectric
- Ionization/Carbon Monoxide
- Photoelectric/Carbon Monoxide

BATTERY COMPARTMENTS

- Battery compartments shall have ready access to facilitate replacement.
- Removal of a battery from a battery-operated unit (or AC with battery back-up) shall result in a readily apparent and prominent indication that the battery has been removed.

MARKINGS

The 2002 edition added (Effective 2004)

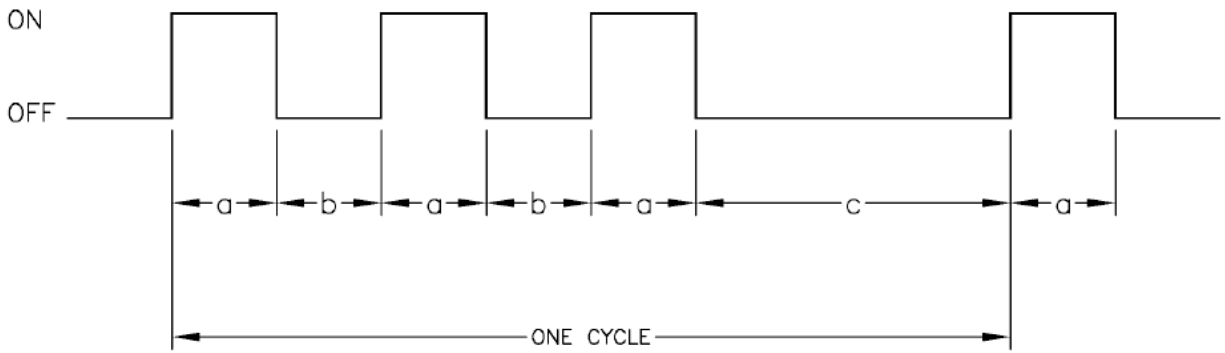
- Requirements for an expiry date that is to be visible on the exterior of smoke alarm.
- Required to have a replacement date at a readily visible location on the smoke alarm after installation.

TEMPORAL PATTERN

June 30th 2013

FIGURE 16
TEMPORAL PATTERN FOR FIRE ALARM SIGNAL

(Reference: Clause 7.30.1.1)



Phase a: signal is on for 0.5 s ±10%
Phase b: signal is off for 0.5 s ±10%
Phase c: signal is off for 1.5 s ±10%
Total cycle to last 4.0 s ±10%

END-OF-LIFE SIGNAL

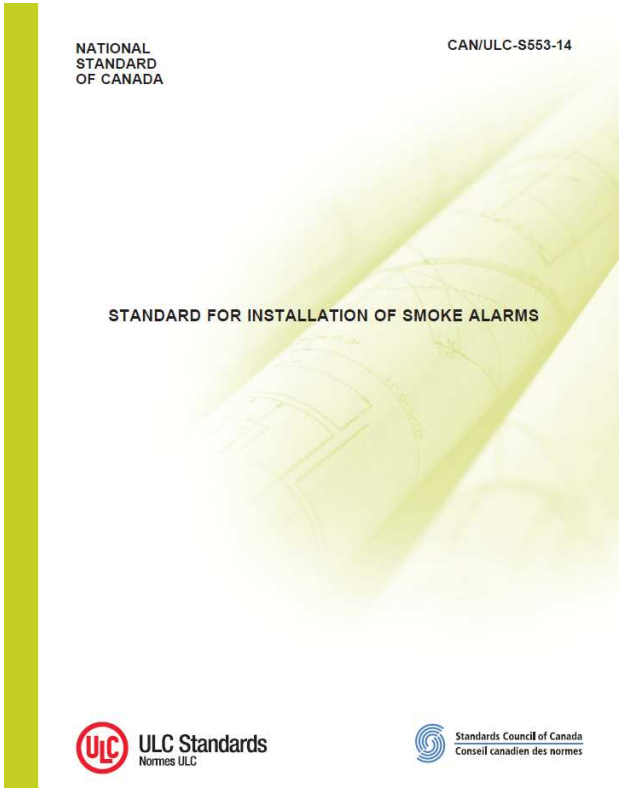
2014 edition:

- The smoke alarm shall indicate end-of-life, based on the manufacturer's specified lifetime (not to exceed 10 years), with an end-of-life signal.
- The end-of-life signal timer shall not be able to be rest after a maximum of 30 days

CAN/ULC-S553 Installation of Smoke Alarms

CAN/ULC-S553 INSTALLATION OF SMOKE ALARMS

- Building Code references 2002 edition
- Current edition is 2014
- Smoke Alarm Installation and Verification Report kept on site
- Always refer to manufacturers installation instructions



CAN/ULC-S553-2014

General requirements:

The owner shall ensure that any person performing the installation of smoke alarms shall be knowledgeable about this Standard and have sufficient experience acceptable to the authority having jurisdiction.

CAN/ULC-S553-2014

Documentation:

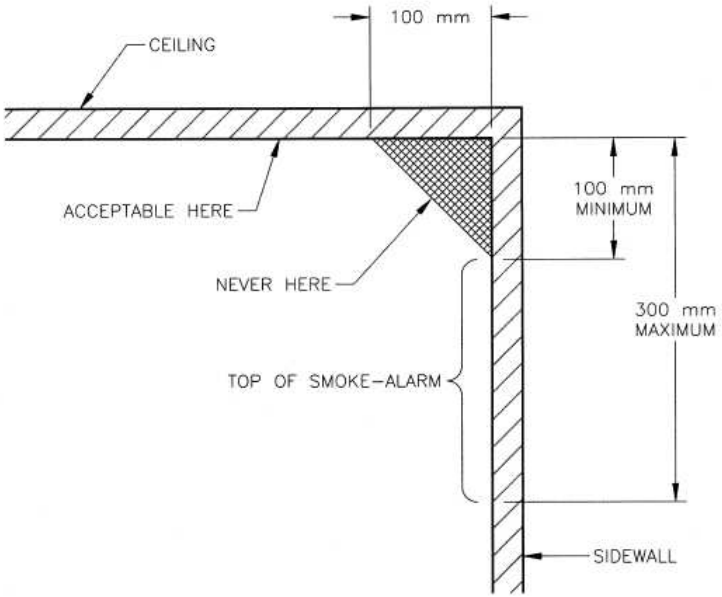
- Installation shall be documented in a report (Appendix C)
- Copy given to building owner kept throughout life of the system
    - Not intended to apply to single family dwellings
- Where installed in vulnerable occupancies, initial installation and verification report – retained throughout the life of the system

INSTALLATION

- Smoke alarm shall be installed in accordance with manufacturers published installation instructions and the requirements of the Building Code
- Installation of all field wiring shall be in accordance with the Electrical Code
- Only compatible devices shall be interconnected

LOCATION OF SMOKE ALARMS

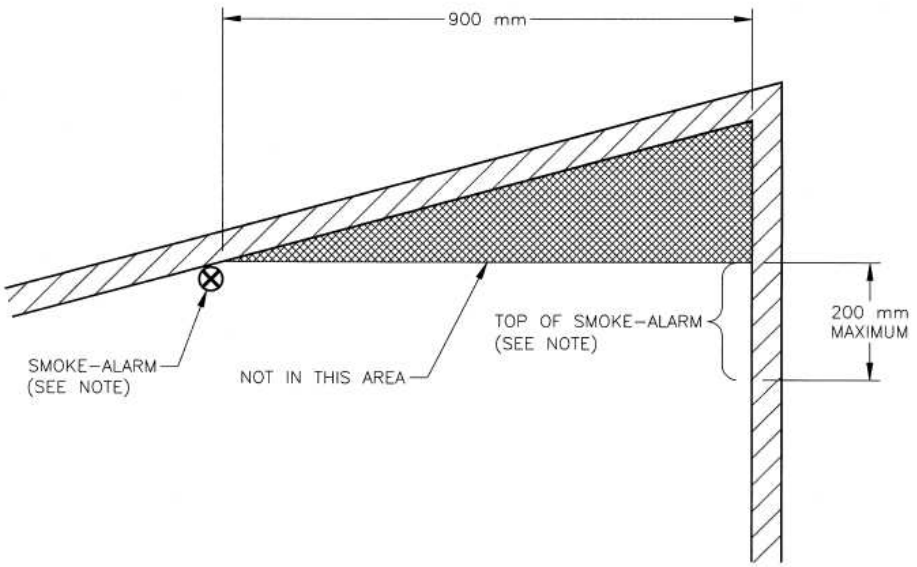
(Reference: Clause 3.2.4, A1.11.1)



Note: Measurements shown are to closest edge of smoke-alarm.

SLOPED CEILINGS

(Reference: Clause 3.2.6)



Note: Smoke-alarms may be located either on the ceiling or on the wall.

CEILINGS WITH BEAMS

(Reference: Clause 3.2.7)

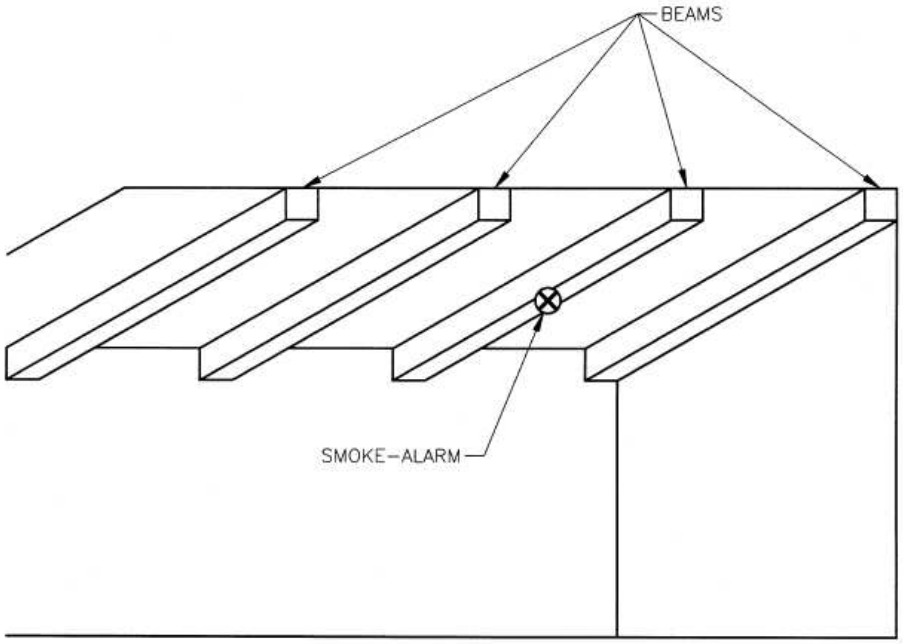


FIGURE 4
LOCATION OF SMOKE ALARMS

(Reference: Clause 5.2.9)

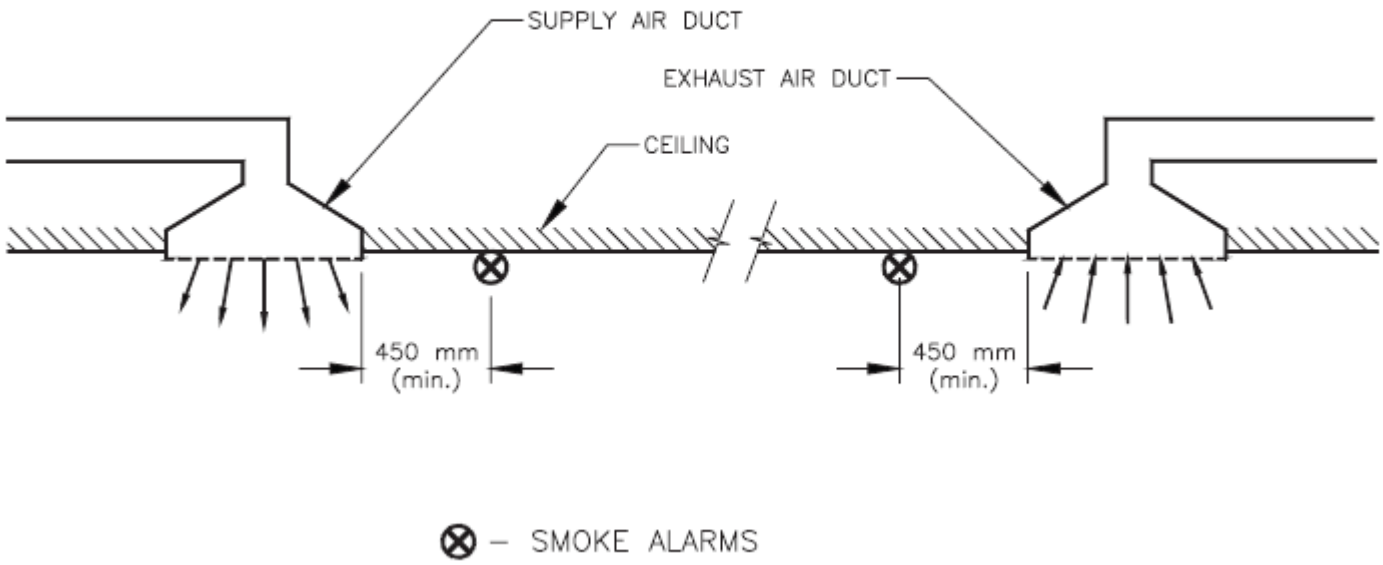
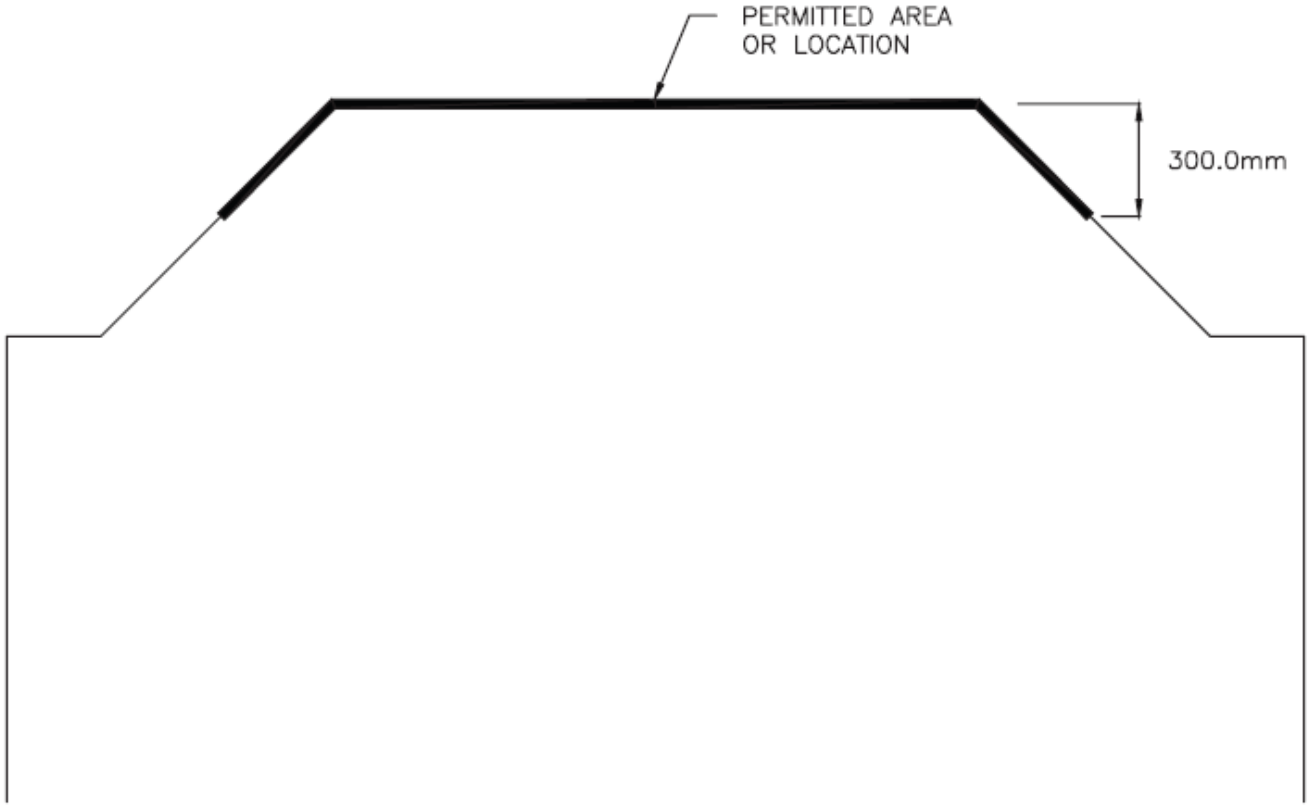


FIGURE 5
LOCATION OF SMOKE ALARMS IN COFFERED OR TRAY-SHAPED CEILINGS

(Reference: Clause 5.2.10)



RECOMMENDED SMOKE-ALARM INSTALLATION FOR TYPICAL APARTMENTS

(Reference: Clauses 3.2.2, 3.2.3)

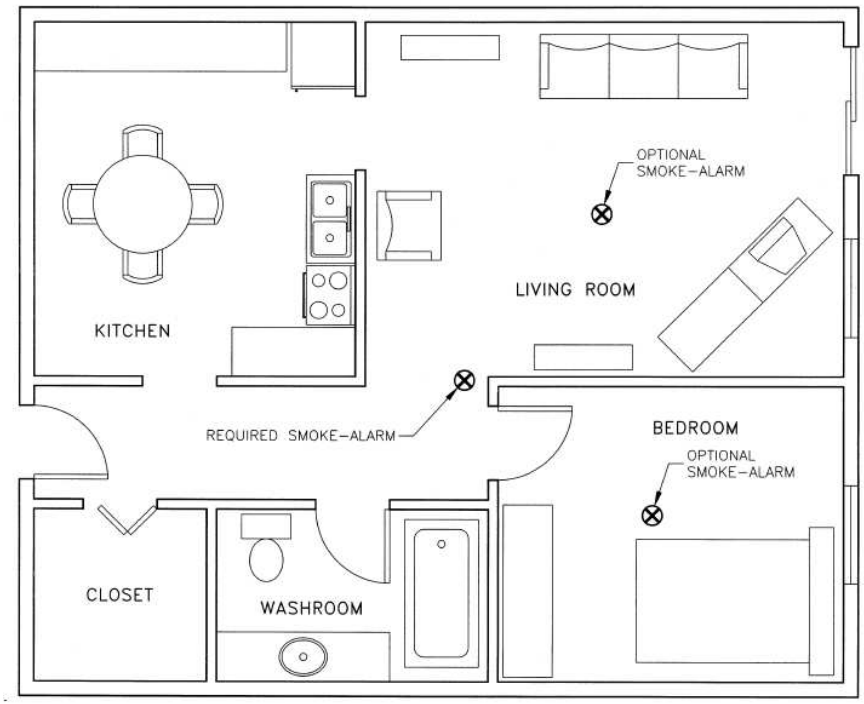
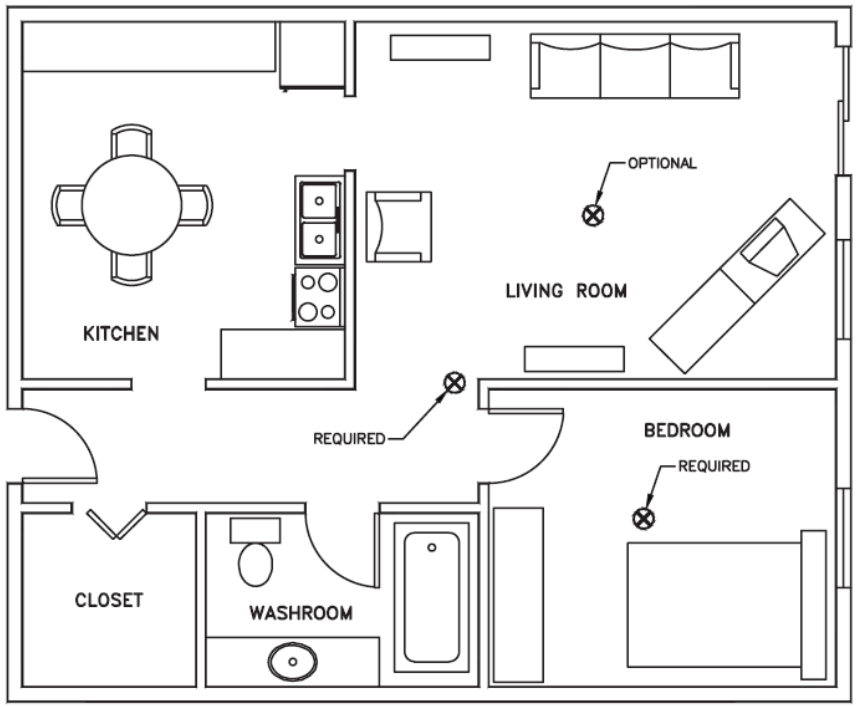


FIGURE A1

RECOMMENDED SMOKE ALARM INSTALLATION FOR A TYPICAL APARTMENT

(Reference: Clauses 5.2.2, 5.2.4, A5.2.2, B1.1.2 and B1.1.4)



RECOMMENDED SMOKE-ALARM INSTALLATION FOR SEPARATED SLEEPING AREAS

(Reference: Clauses 3.2.2, 3.2.3)

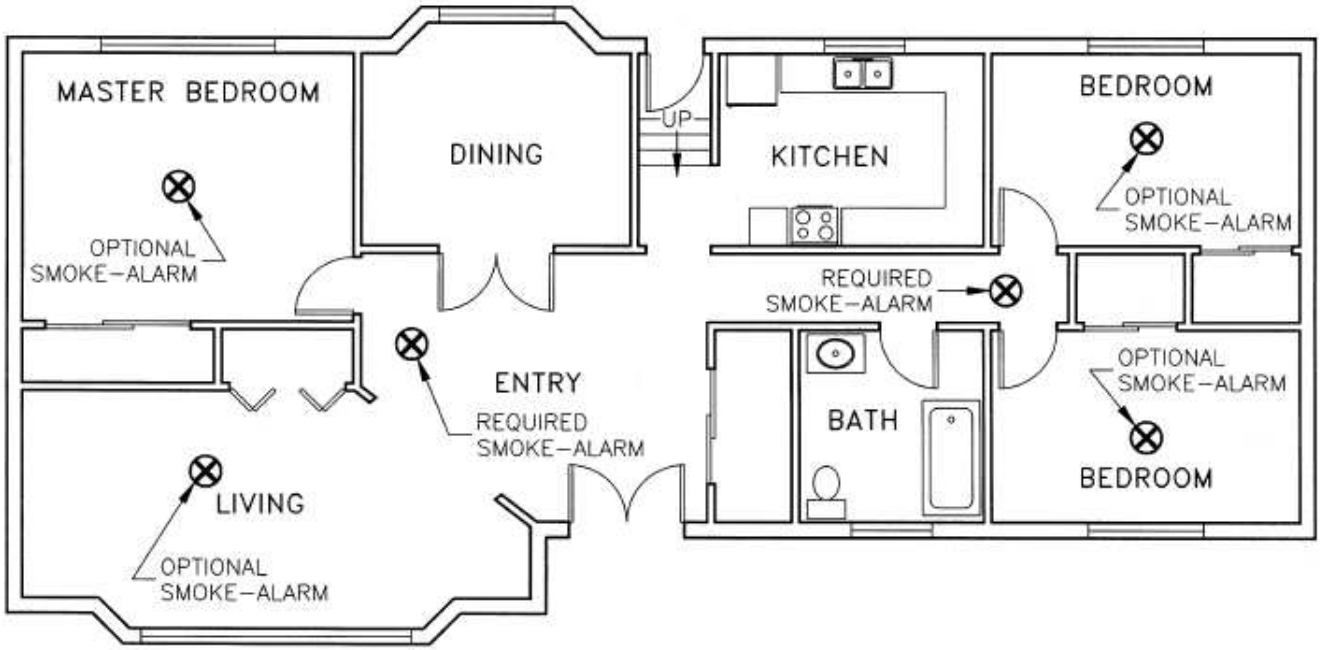
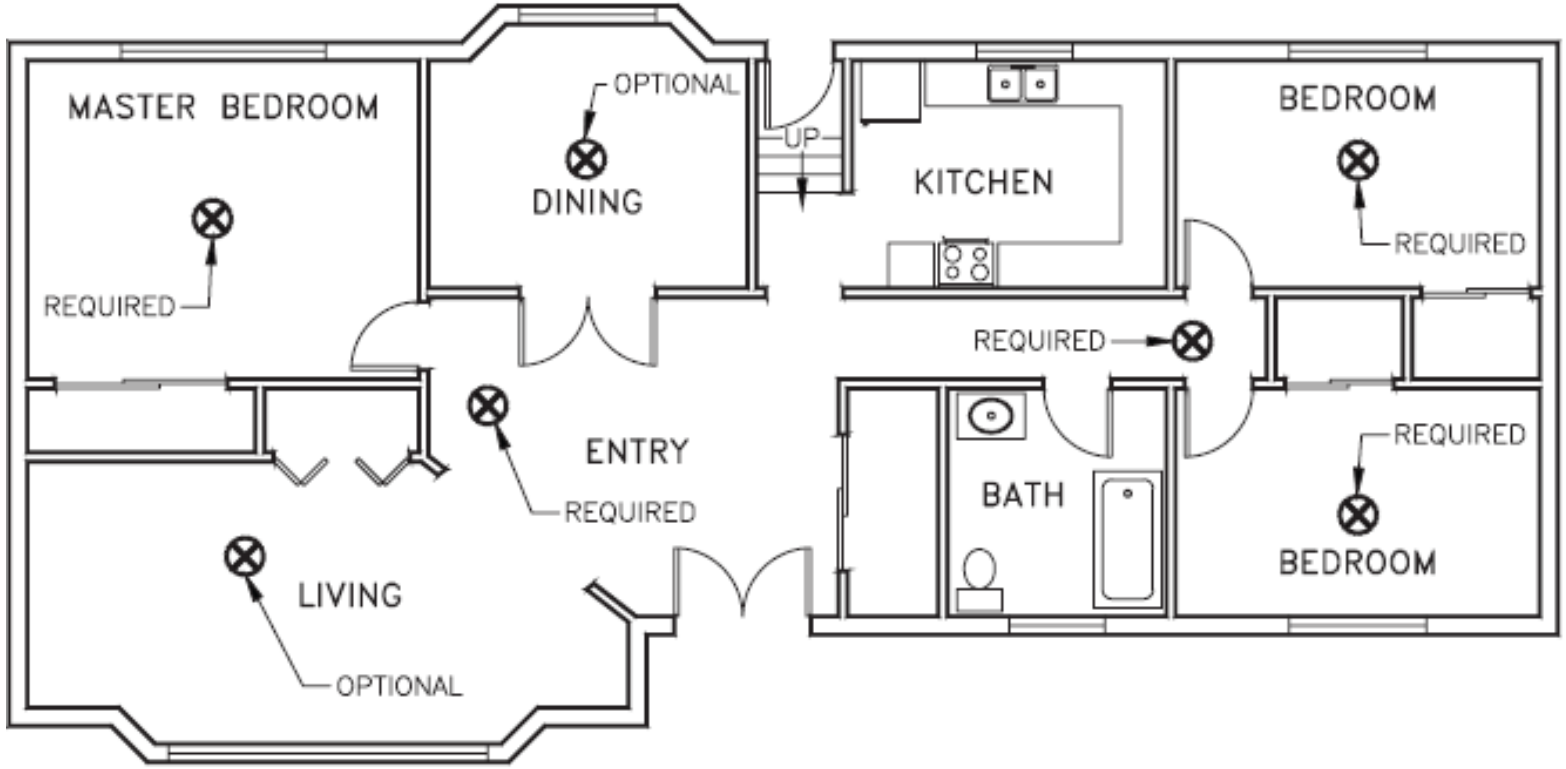


FIGURE A2

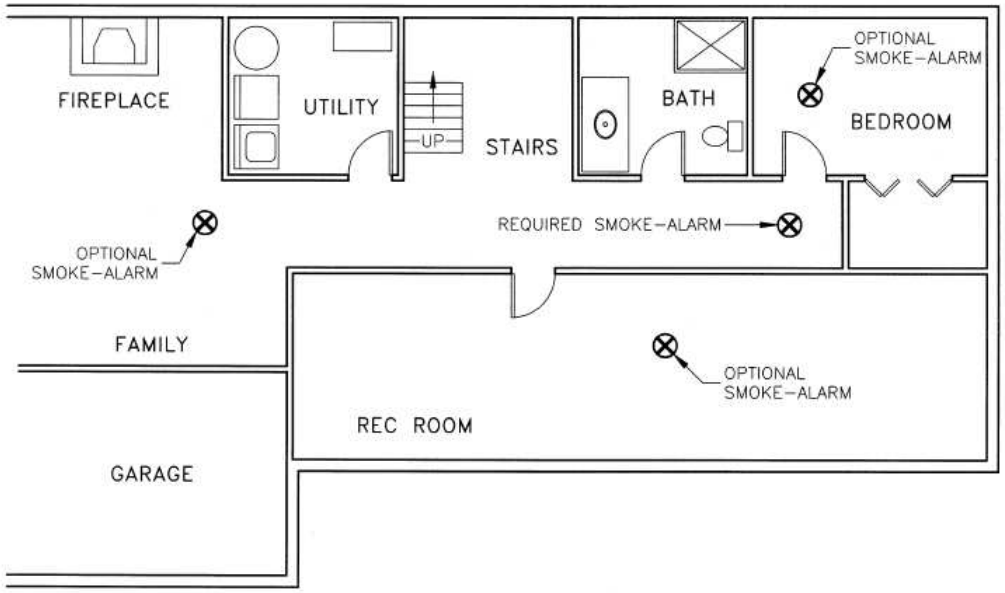
RECOMMENDED SMOKE ALARM INSTALLATION FOR A TYPICAL MAIN FLOOR OF A RESIDENCE

(Reference: Clauses 5.2.2, A5.2.2, B1.1.2 and B1.1.4)



RECOMMENDED SMOKE-ALARM INSTALLATION FOR BASEMENTS

(Reference: Clauses 3.2.2, 3.2.3)

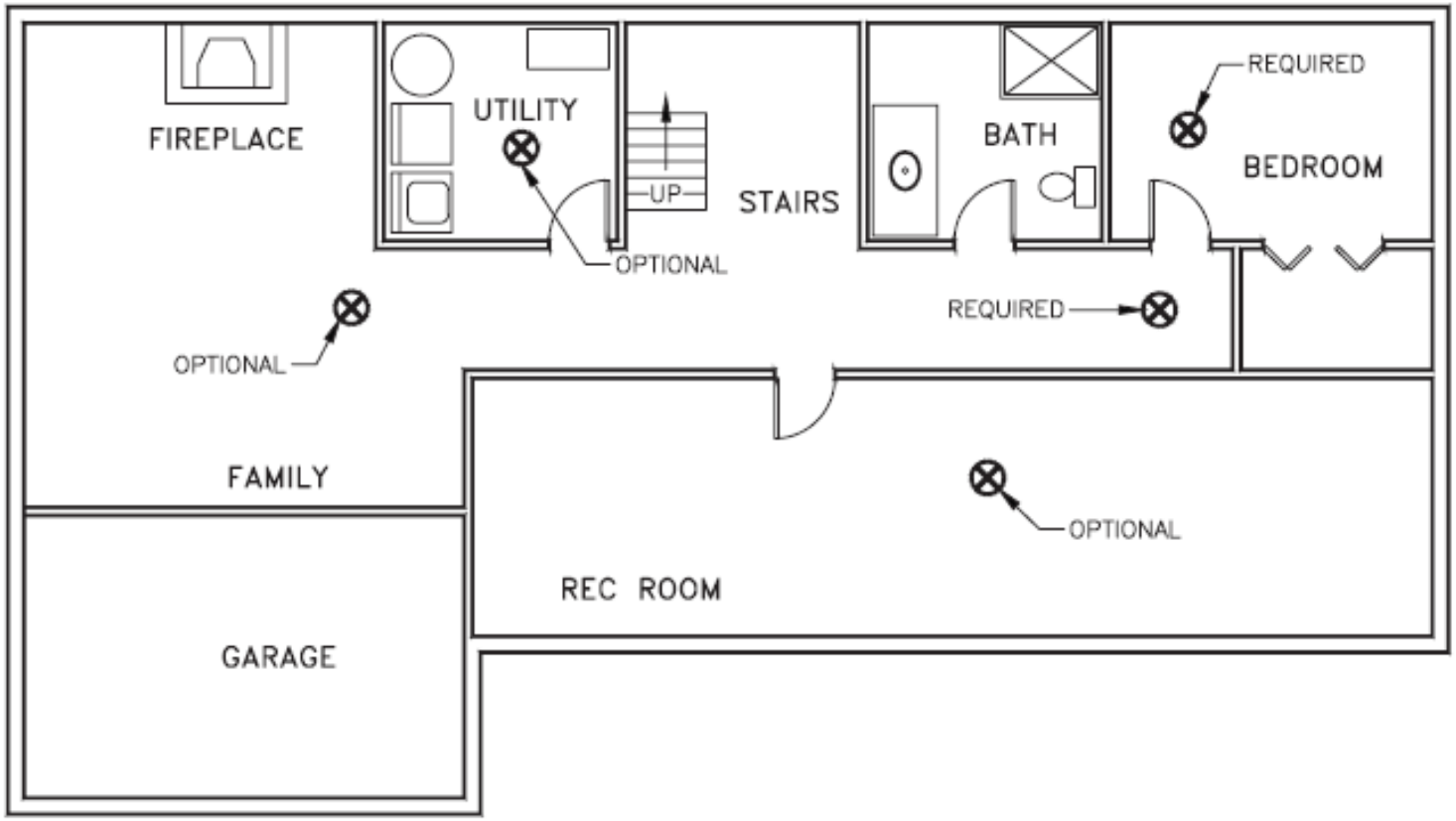


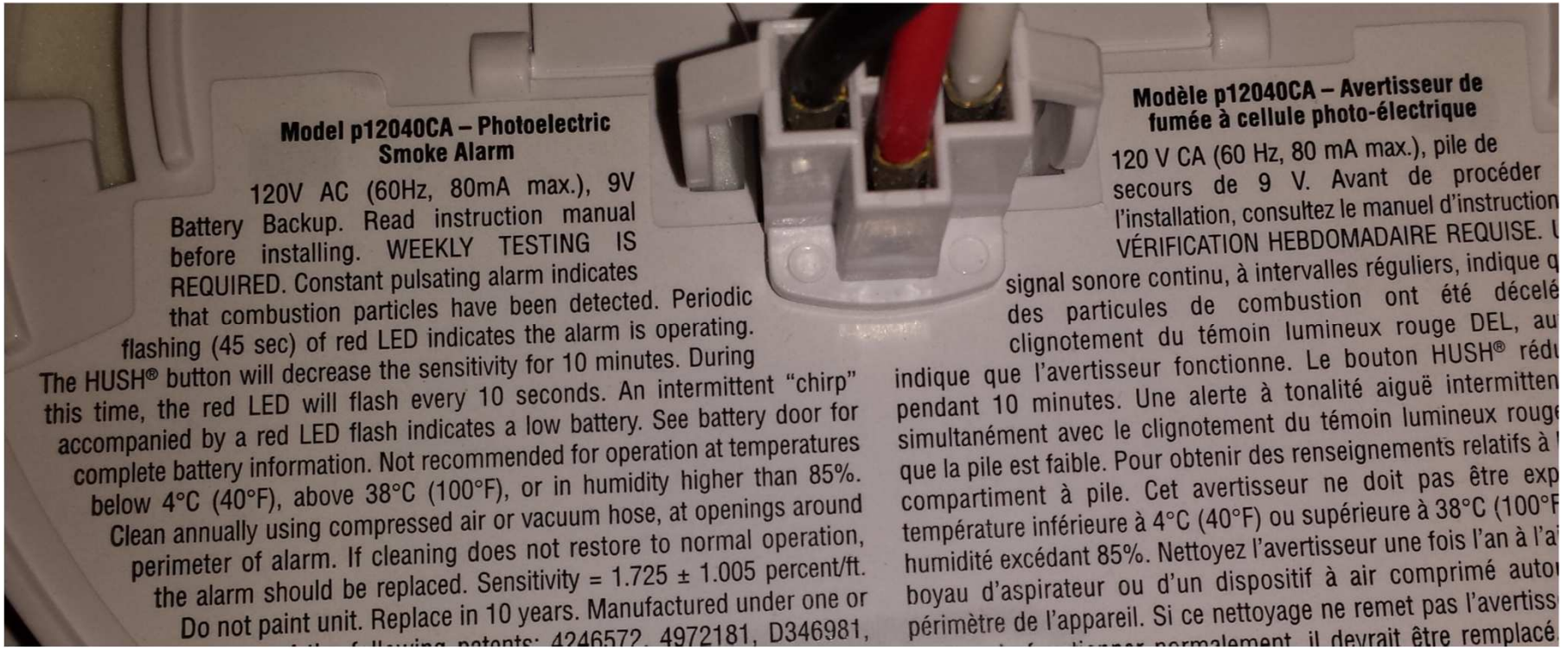
Note: Smoke-alarms should be located in vicinity of sleeping areas. For separated sleeping areas, multiple station type devices should be used

FIGURE A3

RECOMMENDED SMOKE ALARM INSTALLATION FOR TYPICAL BASEMENT OF A RESIDENCE

(Reference: Clauses 5.2.2, 5.2.4, A5.2.2, B1.1.2 and B1.1.4)



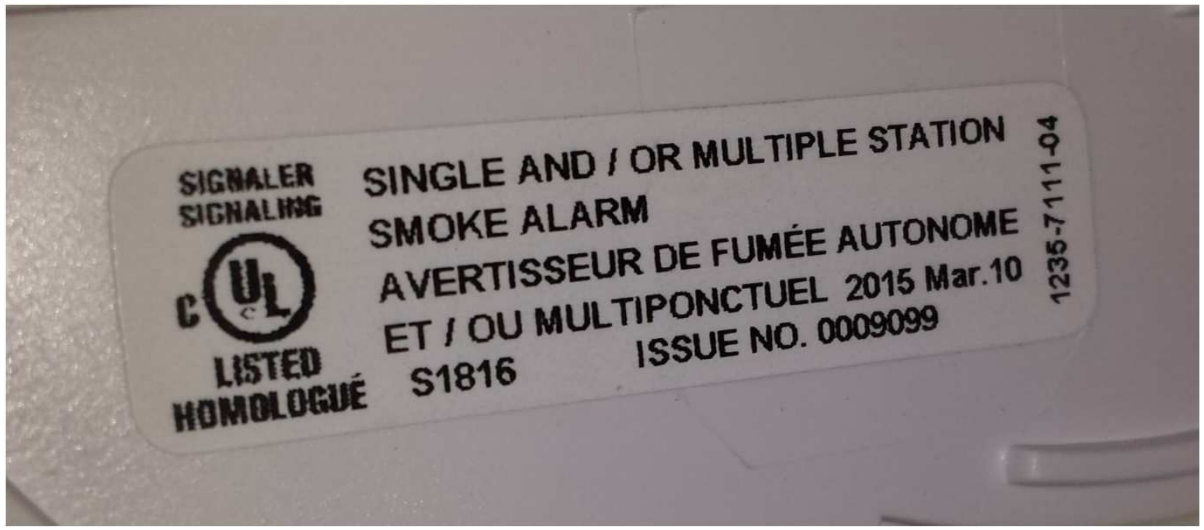


Model p12040CA – Photoelectric Smoke Alarm

120V AC (60Hz, 80mA max.), 9V Battery Backup. Read instruction manual before installing. WEEKLY TESTING IS REQUIRED. Constant pulsating alarm indicates that combustion particles have been detected. Periodic flashing (45 sec) of red LED indicates the alarm is operating. The HUSH® button will decrease the sensitivity for 10 minutes. During this time, the red LED will flash every 10 seconds. An intermittent "chirp" accompanied by a red LED flash indicates a low battery. See battery door for complete battery information. Not recommended for operation at temperatures below 4°C (40°F), above 38°C (100°F), or in humidity higher than 85%. Clean annually using compressed air or vacuum hose, at openings around perimeter of alarm. If cleaning does not restore to normal operation, the alarm should be replaced. Sensitivity = 1.725 ± 1.005 percent/ft. Do not paint unit. Replace in 10 years. Manufactured under one or

Modèle p12040CA – Avertisseur de fumée à cellule photo-électrique

120 V CA (60 Hz, 80 mA max.), pile de secours de 9 V. Avant de procéder l'installation, consultez le manuel d'instruction VÉRIFICATION HEBDOMADAIRE REQUISE. U signal sonore continu, à intervalles réguliers, indique q des particules de combustion ont été décelé clignotement du témoin lumineux rouge DEL, au indique que l'avertisseur fonctionne. Le bouton HUSH® rédu pendant 10 minutes. Une alerte à tonalité aiguë intermitten simultanément avec le clignotement du témoin lumineux rouge que la pile est faible. Pour obtenir des renseignements relatifs à compartiment à pile. Cet avertisseur ne doit pas être exp température inférieure à 4°C (40°F) ou supérieure à 38°C (100°F humidité excédant 85%. Nettoyez l'avertisseur une fois l'an à l'ai boyau d'aspirateur ou d'un dispositif à air comprimé auto périmètre de l'appareil. Si ce nettoyage ne remet pas l'avertiss normalement, il devrait être remplacé.



LISTING

- Listing Marks are Applied
- Marks comply with requirements laid out by Standards Council of Canada


>ABS<
UL
LISTED
Q.C.
PASS

ULC Programs

ULC Programs

- **ULC Evaluation Reports**
- **Field Evaluation of Electrical and Gas Equipment**
- **Field Certification Program**
- **Fire Extinguisher Service Agency Program**

ULC Programs

- **ULC Fire Protective Signaling Certificate Program**
  - CAN/ULC-S561

Underwriters Laboratories

Certificate No: PS987654
File No: 81234 CCN: DAYIC
Service Center No: 1
Expires: 11/12/2020
Issued: 11/12/2015

FIRE PROTECTIVE SIGNALING CERTIFICATE
(CAN/ULC-S561)

This Certifies that the Alarm Companies whose names appear below are Listed by ULC and are authorized to install, monitor, and maintain Protective Signaling Fire Alarm Systems in compliance with the requirements in CAN/ULC-S561 for Protective Signaling Systems.

The assignment of responsibilities as indicated shall be set out in a contract between the companies involved.

The Alarm Monitoring Company named on this certificate bears the responsibility for the monitoring of the status of signals generated by the system and for the keeping of records respecting these activities.

The Alarm Installation Company named on this certificate bears the responsibility for the correctness of the system installation, periodic testing, maintenance repair, as well as the keeping of records respecting these activities.

It is also the responsibility of the Alarm Installation Company to confirm that the equipment used in the installation is ULC Labelled and is suitable for the application. All required service is provided for in the care contract between the Alarm Installation Company and the Occupant.

ULC makes no representations or warranties, expressed or implied, that the alarm system will prevent any loss by fire, smoke, water damage, or otherwise, or that the system will in all cases provide the protection for which it is installed or intended. The certificate is evidence that the signaling devices are monitored by a ULC Listed Alarm Monitoring Company and that the installation, maintenance and service is provided by a ULC Listed Alarm Installation Company, which are subject to counter/check field inspections by ULC Representatives. This certificate is to be posted at the Subscriber's site and is valid only with a current maintenance contract.

ULC is not an insurer and does not assume any obligation or undertake to discharge any liability of the Alarm Companies or any other party for any loss, which may result from failure of equipment, incorrect installation, non-conformity with requirements, cancellation of this certificate or withdrawal of the Alarm Company from Listing by ULC prior to the expiration date appearing on this certificate.

SN: PS987654

Protected Property:
ABC Company
123 Main Street,
Anywhere, ON
A1A 1A1

Alarm Service Company:
XYZ Monitoring Station
987 Railway Street,
Anywhere, ON
A1A 1A1

Alarm System Description:
This system is installed and operated in accordance with STANDARD CAN/ULC-S561,2013 edition.
System Description
System Type: Fire Protective Signaling
Authority Having Jurisdiction: City of Anywhere
Responding Fire Department: City of Anywhere
SYSTEM DEVIATIONS FROM REFERENCED STANDARDS:
None
Sprinkler System Waterflow Alarm and Supervisory Service:
Sprinkler System Type: Fire Panel
Control or Transmitter Unit:
Vista 32FB.
Alarm Transmission Method Digital Alarm Communicator
Local F/A Interconnection Yes

- **ULC Fire Alarm Systems, Inspection and Testing Certificate Program**
  - CAN/ULC-S537 and S536

- **ULC Qualified FireStop Contractor**

Underwriters Laboratories
Laboratoires des Assureurs
Qualified Firestop Contractor Program

CLEB, a UL company is a building envelope consulting and testing firm offering a unique gateway to services related exclusively to the building envelope field.

- Over 30 years experience with projects across Eastern Canada and the Northern United States;
- Over 85 employees - engineers, architects, technologists and specialists;
- Testing facility in Montreal serving Eastern Canada and Northern United States;
- Testing facility in Chicago serving Western Canada and the Midwest United States;
- Both laboratory facilities are fully accredited to Canadian and US standards.

Montreal

Canada Headquarters
1320 Lionel-Boulet Blvd
Varennes, Quebec J3X 1P7
Tel. : 855.353.CLEB (2532)
montreal@cleb.com

Chicago

US Headquarters
750 Anthony Trail
Northbrook, IL 60062
Tel. : 855.353.CLEB (2352)
chicago@cleb.com

Quebec City

420, Charest East Blvd, Suite 300
Quebec, Quebec G1K 8M4
Tel. : 855-353-CLEB (2532)
quebec@cleb.com

Ottawa

29, Capital Drive, Suite 200
Ottawa, Ontario K2G 0E7
Tel. : 855-353-CLEB (2532)
ottawa@cleb.com

Truro

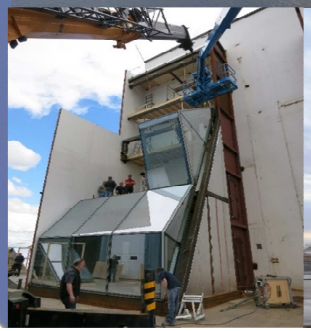
64, Inglis Place, Suite 203
Truro, Nova Scotia B2N 4B4
Tel. : 855-353-CLEB (2532)
truro@cleb.com

New York

747, Third Ave., 2nd Floor,
New York NY 10017
Tel.: 855-353-CLEB (2532)
newyork@cleb.com

PROFESSIONAL SERVICES

- Building envelope testing and commissioning
- Building envelope investigations and failure analysis
- Forensic investigations and construction litigation support
- Knowledge transfer, research and development



CLEB
a UL company

SUMMARY

- Building and Fire Code Requirements
- Changes to the Smoke Alarm Standard
- Smoke Alarm Installation Standard
- Smoke Alarm Maintenance Standard
- Resources Available

Thank you

Brian McBain
Tel: 613-751-3404
Email: Brian.McBain@ul.com

FIND US ON…