

1. Legislative requirements

As of April 2003, Building Code clause F7 Emergency Warning Systems requires that smoke alarms are installed in every household unit. Under s.112 of the Building Act, any new building work on a single household unit triggers the requirement for the building to be upgraded (this includes installing smoke alarms). For the purposes of this section of the Act, new building work includes carrying out work associated with the household unit (including any building work for new or altered or extended ancillary or outbuildings associated with the household unit).

S m o k e a l a r m s s a v e l i v e s !

This means that if an owner carries out any alterations to a household unit of SH (sleeping residential) or SM (sleeping non-institutional) risk group, a building consent will not be issued unless smoke alarms are shown on consent documentation as per the requirements of clause F7.

2. Smoke alarms

Domestic smoke alarms must be Type 1, which have:

- a hush button so that the alarm can be cleared without shutting off power (i.e. by removing the battery)
- a test button

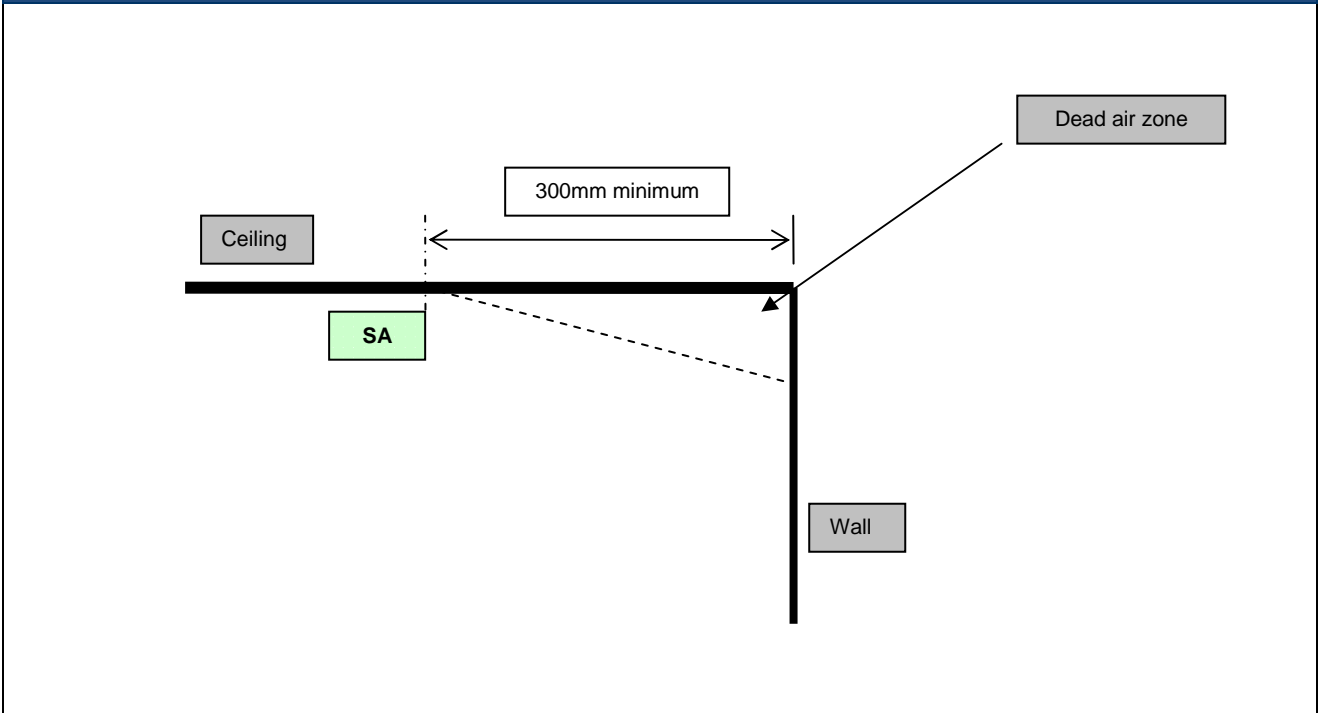


3. Installations

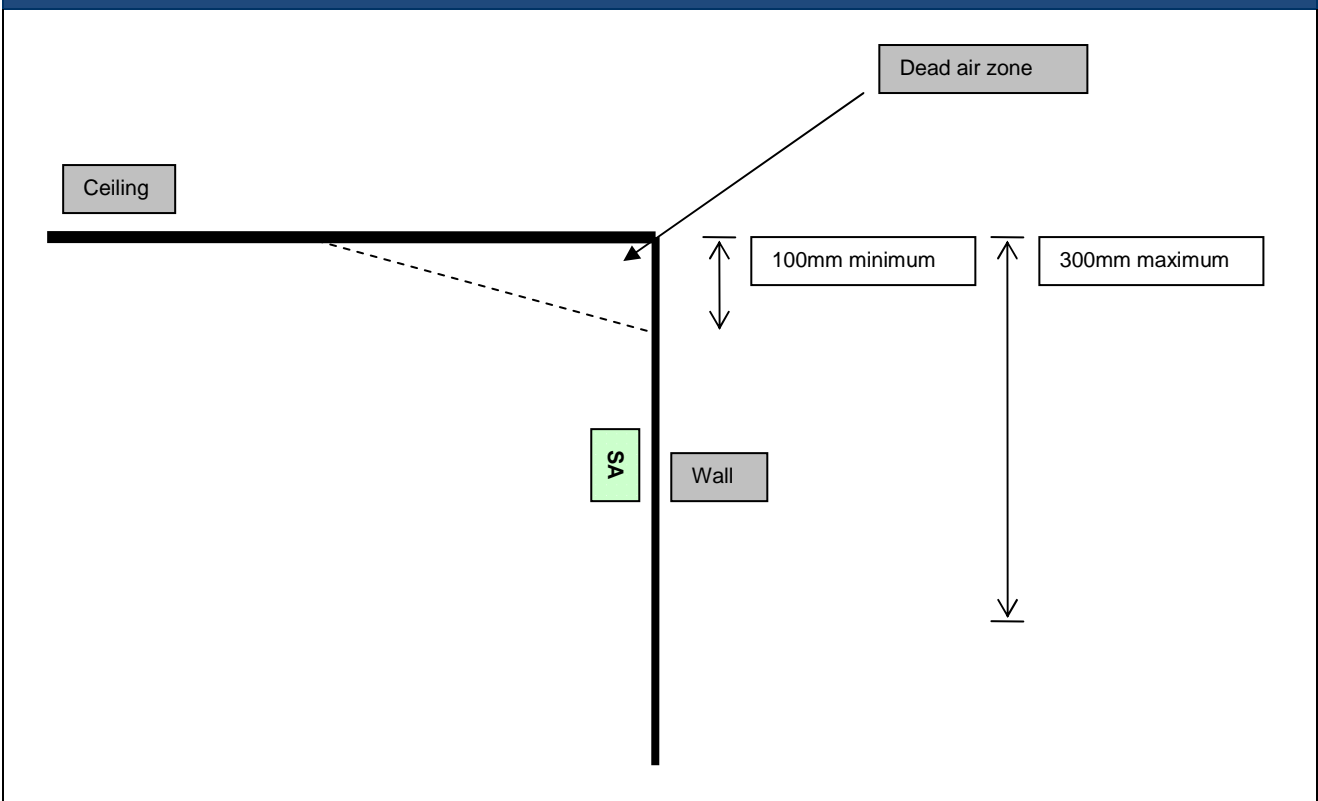
Smoke alarms shall be installed as follows:

- In multi-storey buildings, there shall be at least one smoke alarm on each level, and if more than one unit per level, then the requisite number of smoke alarms in each unit.
- On levels containing the sleeping spaces, the smoke alarms shall be located either:
 - In every sleeping space, or
 - Within 3.0m of every sleeping space door. In this case, the smoke alarms must be audible to sleeping occupants on the other side of the closed doors.
- In all cases, the sound pressure level needs to comply with that specified of 85dBA.
- On (preferably) or near the ceiling – see figures in sections 4-7 of this document.
- Sleep outs.

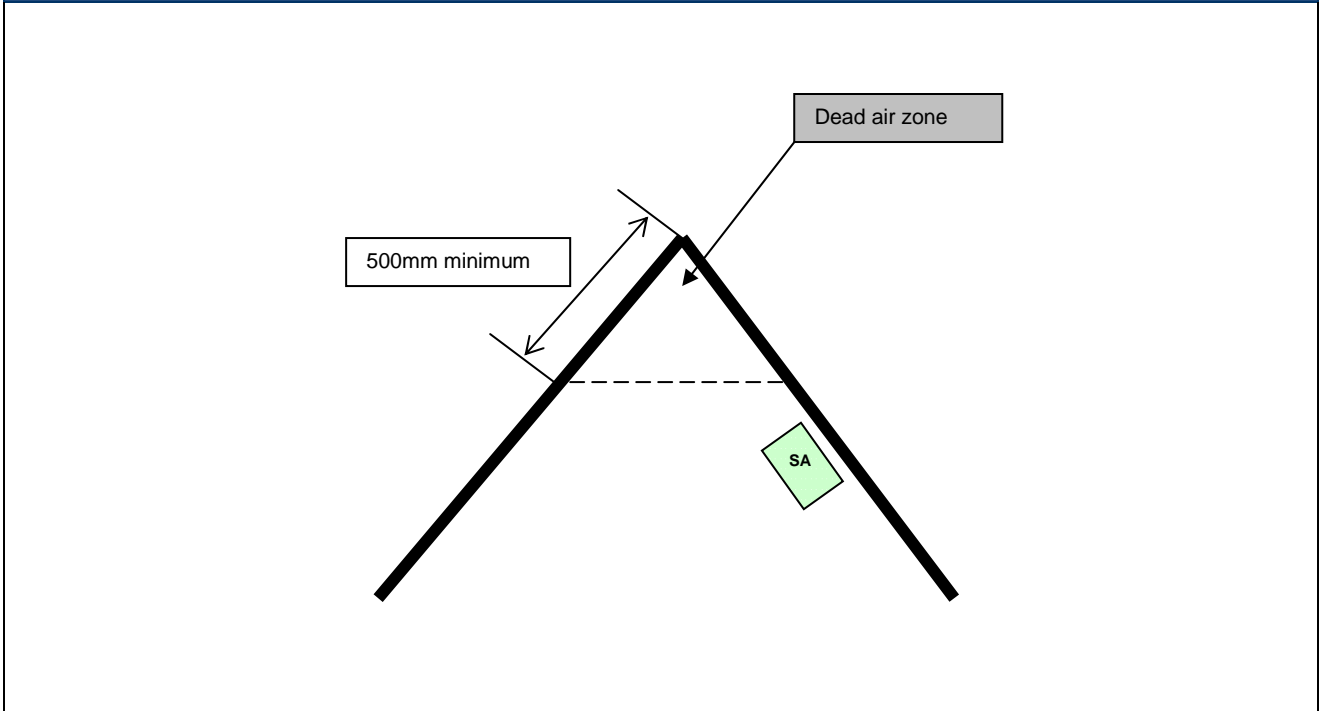
4. Smoke alarm fitted on flat ceiling



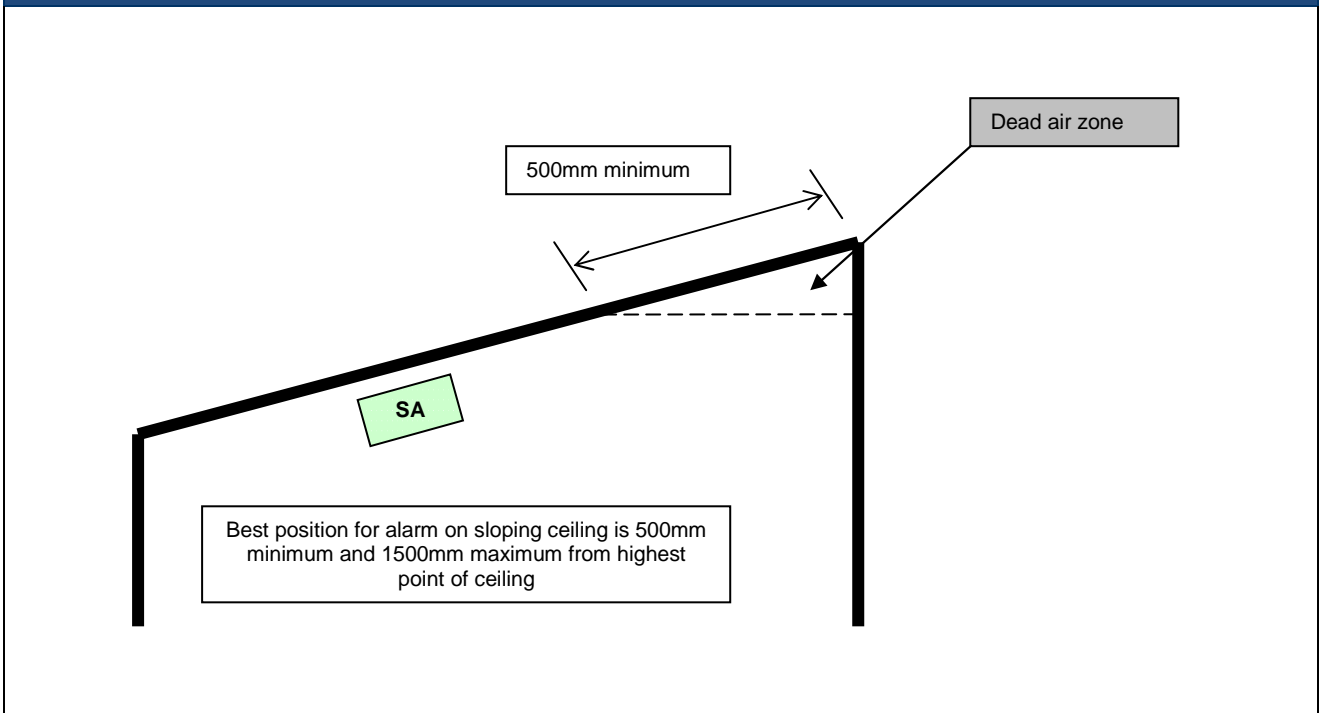
5. Smoke alarm fitted on the wall



6. Smoke alarm fitted on pitched ceiling



7. Smoke alarm fitted on raking or sloping ceiling



8. Extract from New Zealand Building Code clause F7 Warning Systems

3.1 Domestic smoke alarms

3.1.1 Smoke alarms shall be installed in every *household unit* of *risk groups* SH and SM where an automatic fire alarm system activated by smoke detectors and manual call points (Type 4) or automatic fire sprinkler system with smoke detectors and manual call points (Type 7) smoke detection and alarm system is not required by Acceptable Solutions C/AS1 to C/AS7.

3.1.2 The other paragraphs of F7/AS1 do not apply to the installation of domestic smoke alarms specified under Paragraph 3.1 to 3.4 stand alone and only detail the requirements for domestic smoke alarms within household units.

3.2 Type 1 Domestic smoke alarm system

3.2.1 This system is based around one or more domestic type smoke alarms with integral alerting devices. Coverage shall be limited to selected parts of a single firecell, subject to the conditions in paragraphs 3.3 and 3.4 below.

3.2.2 Smoke alarms shall be listed or approved by a recognised national authority as complying with at least one of: UL 217, CAN/ULC S531, AS 3786, BS 5446: Part 1, ISO 12239 or BS EN 14604.

3.2.3 The smoke alarms shall be either hard wired or battery powered and are not required to be interconnected. In addition, they shall provide a hush facility, being a button that silences the alarm for a minimum duration of 60 seconds.

COMMENT:

This allows the cause of a nuisance alarm to be cleared without removing the battery to silence the smoke alarm.

3.2.4 Smoke alarms shall have an alarm test facility readily accessible by the building occupants. This facility may be located on the smoke alarms.

3.3 Location of smoke alarms

3.3.1 Smoke alarms shall be located as follows:

- In multi-storey units, there shall be at least one smoke alarm on each level within the household unit
- On levels containing the sleeping spaces, the smoke alarms shall be located either:
 - In every sleeping space, or
 - Within 3.0m of every sleeping space door. In this case, the smoke alarms must be audible to sleeping occupants on the other side of the closed doors.
- In all cases, so that the sound pressure level complies with that specified of 85dBA

On (preferably) or near the ceiling – see figures sections 4 to 7 of this document

COMMENT:

Smoke alarms also need to be located so that an alarm is given before the escape route from any bedroom becomes blocked by smoke. This includes those parts of escape routes on other floors. Although not required by the Acceptable Solution, the interconnection of individual smoke alarms should be considered if audibility is a problem. Smoke alarms need to be heard by sleeping occupants. In this Acceptable Solution, audibility is assumed if the sound pressure level is 60 dB(A) within the sleeping area with all doors closed.

3.3.2 Smoke alarms shall be installed on or near the ceiling in accordance with AS 3786 and the manufacturer's instructions.

COMMENT:

AS 3786 gives instructions for the physical location of smoke alarms. Smoke alarms need to be situated on (or near) the ceiling for optimum detection of smoke in a *fire* situation. Observance of the manufacturer's instructions is important to ensure smoke alarms are physically mounted correctly. Such information is usually device specific.

3.4 Maintenance

3.4.1 Recommended maintenance procedures are:

- a) In-situ annual cleaning with a vacuum cleaner (no disassembly of smoke alarm)
- b) Monthly testing by use of the smoke alarm's "test" facility

COMMENT:

These smoke alarms are exempt from the usual ongoing compliance schedule regime. A test facility is necessary to allow basic maintenance by the building owner/occupier. The above are maintenance procedures that do not require any special technical knowledge, or disassembly of any part of the system.

The other maintenance recommendation is for the smoke alarms to be annually cleaned in-situ using a vacuum cleaner, with no disassembly of the smoke alarm. The purpose of this is to remove dirt and dust from both the outside of the smoke alarm (blocks smoke entry) and the smoke-sensing chamber inside (makes it either less sensitive, or over-sensitive). It must be recognised that any smoke alarm installed will have a limited service life (approximately 10-15 years maximum) provided it is well maintained and cared for.

Gradual deep-seated soiling and degradation of components will eventually necessitate replacement of the smoke alarm units. Lack of maintenance will shorten this lifetime.

9. References

New Zealand Building Code clause F7 Warning Systems (Fourth edition)