

Compliance Document for New Zealand Building Code Clause F7 Warning Systems – Fourth Edition

Prepared by the Department of Building and Housing

This Compliance Document is prepared by the Department of Building and Housing. The Department of Building and Housing is a Government Department established under the State Sector Act 1988.

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ISBN: 978-0-478-38184-9 (print)
ISBN: 978-0-478-38185-6 (electronic)

Compliance Documents are available from www.dbh.govt.nz

New Zealand Government

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Users should make themselves familiar with the preface to the New Zealand Building Code Handbook, which describes the status of Compliance Documents and explains alternative methods of achieving compliance.

Defined words (italicised in the text) and classified uses are explained in Clauses A1 and A2 of the Building Code and in the Definitions at the start of this Compliance Document.

F7: Document History			
	Date	Alterations	
First published	July 1992		
Second edition incorporating Amendment 1	December 1993	p. v, Contents p. vi, References	p. vii, Definitions p. 3 to 8, Complete rewrite
Amendment 2	19 August 1994	pp. i and ii, Document History p. 4, 1.2.5, 1.3.3, 1.3.4, 1.4.3	p. 5, 1.4.4, 1.4.5, 1.5.4 p. 7 and 8, Index
Amendment 3	1 December 1995	p. ii, Document History p. vi, References p. 3, 1.1.1, 1.1.2, 1.1.3, 1.2.1, 1.2.2, 1.2.3	p. 4, 1.4.2 p. 5, 1.5.1 p. 6, 2.2.5 added
Reprinted incorporating Amendments 1, 2 and 3	April 1998		
Third edition	1 December 2000 Effective from 1 June 2001	Document revised – third edition issued	
Amendment 4	24 April 2003	p. 3, Code Clause p. 5, Contents p. 7, References	p. 13, 1.2.1 Type 1 pp. 17 and 18, 3.1-3.4 p. 20, Index
Reprinted incorporating Amendment 4	April 2004		
Amendment 5 4 July 2005	Effective 1 October 2005	pp. 1-2, Document History and Status pp. 7-8, References	pp. 9-10, Definitions pp. 13-14, F7/AS1
Amendment 6	Effective 1 November 2008	p. 2, Document History p. 5, Contents p. 7, References p. 9, Definitions p. 13, 1.2.1	p. 14, 1.2.5, 1.2.6, 1.2.8, 1.3.1 p. 15, 1.3.5, 1.3.6 p. 16, 2.1, 2.1.2 p. 17, 2.2.4 pp. 19-20, Index
Amendment 7	Effective 10 October 2011 until 10 April 2013	pp. 1-2, Document History and Status p. 3, Code Clause	p. 7, References p. 17, F7/AS1 3.2.2
Fourth edition	10 April 2012	Document revised – fourth edition issued	
Note: Page numbers relate to the document at the time of Amendment and may not match page numbers in current document.			

Document Status

The most recent version of this document, as detailed in the Document History, is approved by the Chief Executive of the Department of Building and Housing. It is effective from 10 April 2012 and supersedes all previous versions of this document on 10 April 2013.

People using this Compliance Document should check for amendments on a regular basis. The Department of Building and Housing may amend any part of any Compliance Document at any time. Up-to-date versions of Compliance Documents are available from www.dbh.govt.nz

New Zealand Building Code Clause F7 Warning Systems

The mandatory provisions for building work are contained in the New Zealand Building Code (NZBC), which comprises the First Schedule to the Building Regulations 1992. The relevant NZBC Clause for Warning Systems is F7.

FIRST SCHEDULE—continued	
Clause F7—WARNING SYSTEMS	
Provisions	Limits on application
<p>OBJECTIVE F7.1 The objective of this provision is to safeguard people from injury or illness due to lack of awareness of an emergency.</p> <p>FUNCTIONAL REQUIREMENT F7.2 <i>Buildings</i> shall be provided with appropriate means of warning people to escape to a <i>safe place</i> in an emergency.</p> <p>PERFORMANCE F7.3.1 A means of warning must alert people to the emergency in <i>adequate</i> time for them to reach a <i>safe place</i>.</p> <p>F7.3.2 Appropriate means of detection and warning for fire must be provided within each <i>household unit</i>.</p> <p>F7.3.3 Appropriate means of warning for fire and other emergencies must be provided in <i>buildings</i> as necessary to satisfy the other performance requirements of this code.</p>	<p>Performance F7.3 does not apply to <i>Outbuildings, backcountry huts or Ancillary buildings</i>.</p>

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References

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For the purposes of New Zealand Building Code compliance, the New Zealand and other Standards, and other documents referred to in this Compliance Document (primary reference documents) shall be the editions, along with their specific amendments, listed below. Where the primary reference documents refer to other Standards or other documents (secondary reference documents), which in turn may also refer to other Standards or other documents, and so on (lower order reference documents), then the applicable version of these secondary and lower order reference documents shall be the version in effect at the date this Compliance Document was published.

	Where quoted
Standards New Zealand	
NZS 4512: 2010 Fire alarm systems in buildings	AS1 1.1.1, 1.2.2, 1.2.3, 1.2.4, 1.2.6, 1.2.7, 1.3.1
NZS 4514: 2009 Interconnected smoke alarms for houses	AS1 3.3.1 c), 3.3.2, 3.4.1
NZS 4515: 2009 Fire sprinkler systems for life safety in sleeping occupancies (up to 2,000 m ²)	AS1 1.2.8
NZS 4541: 2007 Automatic fire sprinkler systems <i>Amend: 1</i>	AS1 1.2.8
Standards Australia	
AS 3786: 1993 Smoke alarms <i>Amends: 1, 2, 3, 4</i>	AS1 3.2.2
International Standards Organisation	
ISO 12239: 2003 Fire detection and fire alarm systems – smoke alarms	AS1 3.2.2
British Standards Institution	
BS EN 14604: 2005 Smoke alarm devices	AS1 3.2.2

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Definitions

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This is an abbreviated list of definitions for words or terms particularly relevant to this Compliance Document. The definitions for any other italicised words are specified in the New Zealand Building Code Handbook. See Acceptable Solutions and Verification Methods for Protection from Fire for the full list of fire safety definitions.

Building has the meaning given to it by sections 8 and 9 of the *Building Act 2004*.

Exitway All parts of an *escape route* protected by *fire* or *smoke separations*, or by distance when exposed to open air, and terminating at a *final exit*.

Fire The state of combustion during which flammable materials burn producing heat, toxic gases, or smoke or flame or any combination of these.

Firecell Any space including a group of contiguous spaces on the same or different levels within a *building*, which is enclosed by any combination of *fire separations*, *external walls*, roofs, and floors.

Comment:

Floors, in this context, includes ground floors and those in which the underside is exposed to the external environment (eg, when cantilevered). Note also that internal floors between *firecells* are *fire separations*.

Household unit

- a) means a *building* or group of *buildings*, or part of a *building* or group of *buildings*, that is—
 - i) used, or intended to be used, only or mainly for residential purposes; and
 - ii) occupied, or intended to be occupied, exclusively as the home or residence of not more than 1 household; but
- b) does not include a hostel, boarding house or other specialised accommodation.

Occupant load The greatest number of people likely to occupy a particular space within a *building*. It is determined by:

- a) dividing the total floor area by the m² per person (occupant density) for the activity being undertaken, or
- b) for sleeping areas, counting the number of sleeping (or care) spaces, or
- c) for fixed seating areas, counting the number of seats.

Comment:

See Paragraphs 1.4.5 (for fixed seating) and 1.4.6 (for sleeping areas) where appropriate.

Suite A *firecell* providing residential accommodation for the exclusive use of one *person* or of several people known to one another. It comprises one or more rooms for sleeping and may include spaces used for associated domestic activities such as hygiene and cooking.

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Verification Method F7/VM1

No specific test methods have been adopted for verifying compliance with the Performance of NZBC F7.



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Acceptable Solution F7/AS1

1.0 Installation and maintenance of fire alarm systems**1.1 Fire alarm systems**

1.1.1 Fire alarm systems shall be designed, installed and maintained in accordance with NZS 4512 where appropriate and the specific requirements of this Acceptable Solution.

1.2 Descriptions of alarm systems

1.2.1 The types of fire alarms to be provided in buildings shall be determined in accordance with Acceptable Solution C/AS1 to C/AS7. The following text provides specific details on each fire alarm system.

Type 1 – Domestic smoke alarm system

See Paragraph 3.0 – Domestic smoke alarms.

Type 2 – Manual fire alarm system

1.2.2 A single or multiple zone system with an alarm panel to provide defect warning, zone index diagram, and suitable for connection to the Fire Service. The system shall comply with NZS 4512.

Type 3 – Automatic fire alarm system activated by heat detectors and manual call points

1.2.3 A Type 3 system comprises a Type 2 system plus heat detectors and shall comply with NZS 4512.

Type 4 – Automatic fire alarm system activated by smoke detectors and manual call points

1.2.4 A Type 4 system comprises a Type 2 system plus smoke detectors and shall comply with NZS 4512.

Type 5 – Automatic fire alarm system with modified smoke detection and manual call points

1.2.5 Type 5 is a variation of the Type 4 and Type 7 alarm systems requiring part of the smoke detection component to comprise only a local alarm. The local alarm system, activated by the presence of smoke, shall have audible alerting devices to warn only the firecell occupants and the building management, where such management exists.

Comment:

Examples of management situations are motels, hotels or multi-unit residential accommodation in retirement villages.

The local alarm component of a Type 5 system:

- a) Shall be restricted to single firecells containing sleeping accommodation, being household units or individual suites in risk group SM. The local alarm system shall not be extended to other areas such as exitways or common spaces. These shall retain a Type 4 smoke detection system, and
- b) Shall have the facility to be silenced (muted) by a 'hush' switch located at a level readily able to be reached in accordance with Acceptable Solution D1/AS1. The hush switch shall mute the alarm for a time not exceeding 2 minutes, and
- c) Shall be permitted only where an automatic fire detection and alarm system activated by heat detectors (part of the main alarm system) is also installed in sleeping firecells which do not already have an automatic fire sprinkler system.

Where a Type 5 system is installed, mechanical ventilation in accordance with Acceptable Solution G4/AS1 shall be provided in the kitchen area of the household unit or suite.

1.2.6 In exitways and common spaces the required Type 4 or Type 7 system shall not be modified. The system installation for Type 3 and Type 4 components shall comply with NZS 4512.

1.2.7 The system installation for the local smoke alarm component shall also comply with NZS 4512.

Type 6 – Automatic fire sprinkler system with manual call points

1.2.8 Type 6 system is a combined automatic fire sprinkler system and Type 2 alarm. Activation of the sprinklers shall automatically activate the audible alerting devices of the alarm system. Sprinkler installation shall comply with either NZS 4515 or NZS 4541, as modified by Appendix B of Acceptable Solutions C/AS1 to C/AS6.

Type 7 – Automatic fire sprinkler system with smoke detectors and manual call points

1.2.9 A Type 7 system is a combined Type 6 and Type 4 alarm system (including a Type 2 system). Sprinkler installation shall comply with the requirements of a Type 6 system.

Comment:

Smoke detectors are used to gain an earlier warning to life-threatening situations than may be achieved from the response of sprinklers, particularly where a smouldering *fire* does not produce enough heat in its early stages to activate a sprinkler head.

1.3 Location of heat and smoke detectors

1.3.1 Acceptable Solutions C/AS1 to C/AS7 specify which *fire* alarm system shall be installed in each *risk group*. Detectors shall be installed throughout the *firecells* of that *risk group* as required by NZS 4512.

1.3.2 Every space shall have at least one detector (heat, smoke or sprinkler).

2.0 Requirements of fire alarm systems

2.1 Alerting the Fire Service

2.1.1 Where an alarm system is required by Acceptable Solutions C/AS1 to C/AS7, there shall be available a means of communication with the Fire Service.

2.1.2 The means of communication shall be either:

- a) A direct connection (approved by the Fire Service) between the alarm system and the Fire Service, or
- b) A '111' telephone call to the Fire Service from a continuously attended telephone with outside line access serving all *buildings* connected to the alarm system, and having the main *fire* alarm panel or mimic panel visible to the switchboard operator. A warning device shall be provided to alert the operator of a *fire* alarm in any *building* on the site, or

c) Where Paragraph 2.2.3 applies, a telephone (or telephone system) that is available within the *building* and readily accessible at all times to enable '111' calls to be made to the Fire Service.

2.1.3 Telephone communication using the '111' call system (given in Paragraph 2.1.2 c)) may be used only where specifically permitted by Acceptable Solutions C/AS1 to C/AS7.

3.0 Domestic smoke alarms

3.1 Scope

3.1.1 Smoke alarms shall be installed in every *household unit of risk groups* SH and SM where a Type 4 or Type 7 alarm system is not required by Acceptable Solutions C/AS1 to C/AS7.

3.1.2 The other paragraphs of this Acceptable Solution do not apply to the installation of domestic smoke alarms. Paragraphs 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 A Type 1 system is based on one or more domestic type smoke alarms with integral alerting devices. Coverage shall be limited to selected parts of a single *firecell*, subject to Paragraphs 3.3 and 3.4.

3.2.2 Smoke alarms shall be manufactured to at least one of: AS 3786, 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:

A hush facility is a button on the smoke alarm which silences the alarm for a limited time after activation. This allows the cause of a nuisance alarm to be cleared without having to remove the battery to silence the smoke alarm.

3.2.4 Smoke alarms shall have an alarm test facility easily reached 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:

- a) In multi-storey units, there shall be at least one smoke alarm on each level within the *household unit*.
- b) On levels containing the sleeping spaces, the smoke alarms shall be located either:
 - i) In every sleeping space, or
 - ii) Within 3.0 m 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.
- c) In all cases, so that the sound pressure level complies with that specified in NZS 4514.

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 this Acceptable Solution, the interconnection of individual smoke alarms should be considered if audibility is a problem.

3.3.2 Smoke alarms shall be installed on or near the ceiling. The placement shall be in accordance with NZS 4514.

Comment:

NZS 4514 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. Following manufacturer's instructions is important to ensure smoke alarms are physically mounted correctly. This information is usually device specific.

3.4 Maintenance

3.4.1 Smoke alarms shall be maintained in accordance with the maintenance requirements of NZS 4514.

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References are to the relevant paragraphs, figures or tables in **F7/VM1 & AS1** unless otherwise stated. References to Appendices are prefixed by the Appendix letter.

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