Department of
Building and Housing
Te Tari Kaupapa Whare

Dear Customer

Please find enclosed Amendment 9, effective 10 October 2011, to the Compliance Document for the Fire Safety (C) Clauses of the New Zealand Building Code.

Section	**Old C**	**October 2011 Amendments to C**
Title pages	Remove title page and document history	Replace with new title page and document history
References	Remove pages 19–22	Replace with new pages 19–22
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Appendices	Remove page 207/208	Replace with new page 207/208

Compliance Document for New Zealand Building Code Clauses C1, C2, C3, C4 Fire Safety

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.

Enquiries about the content of this document should be directed to:

Department of
Building and Housing
Te Tari Kaupapa Whare

Department of Building and Housing
PO Box 10-729, Wellington.
Telephone 0800 242 243
Fax 04 494 0290
Email: info@dbh.govt.nz

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New Zealand Government

Status of Compliance Documents

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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.

C1, C2, C3 and C4: Document History

	Date	Alterations		
First published December 2000	Effective from 1 June 2001	This document replaces all previous editions of the individual documents C1, C2, C3 and C4.		
Errata	1 July 2001	p. 2 Document History, Status p. 29 Definitions	p. 43 Table 2.1	
Amendment 1	6 January 2002	pp. 4-7 Code Clauses C2, C3		
Amendment 2	24 April 2003	p. 201 A1.3, A2.1.1 Type 1	p. 219 Index	
Amendment 3	25 February 2004	pp. 16-17 Contents pp. 19-22 References p. 27 Definitions p. 33 VM1	pp. 193-199 Part 9 pp. 213-214, 221-223, 226-228 Index	
Amendment 4 4 July 2005	Effective 1 October 2005	p. 2 Document History, Status p.13 Contents pp. 19-20 References pp. 23-29, 31-32 Definitions p. 43 Table 2.1 p. 58 3.5.4 p. 73 3.15.3 p. 89 3.18.1 p. 98 4.5.8 p. 99 4.5.19-4.5.22	pp. 101-106 Table 4.1 p. 108 5.3.1, 5.3.2 pp. 109-11 5.6.2-5.6.13 p. 116 5.9.4 p. 119 6.2.1 p. 120 6.5-6.6.2 p. 121 6.6.4, 6.6.7, 6.7.2 p. 122 6.7.5, 6.7.6, 6.7.9 p. 123 6.9.2 p. 125 6.10.2	p. 127 6.11.1 p. 131 6.14.3 pp. 133-5 6.16.2-6.16.7 p. 142 6.19.13 p. 145 6.20.16 p. 175 7.9.3 p. 176 7.9.8 pp. 179-180 7.10.2-7.10.8 pp. 210-212 Appendix D pp. 213-215, 217-221, 224, 225, 227, 228, Index
Reprinted incorporating Amendment 4	July 2005			
Amendment 5 1 October 2005	1 October 2005	p. 2 Document History p.19 References p. 37 1.3.6 pp. 40-41 2.2.2, 2.2.10 p. 43 Table 2.1 p. 96 4.3.2 p. 98 4.55, 4.5.7 p. 100 Comment	p. 101-4 Table 4.1 p. 107-113 5.1.1, 5.2.1, 5.3.2, 5.3.3, 5.6.1, 5.6.4, 5.6.5, 5.6.8, 5.6.11, 5.7.9 p. 119 6.1.1, 6.6.3 p. 122 6.7.5 p. 123 6.8.5 p. 126 6.10.2	p. 127 6.11.2 p. 143 6.19.14 p. 150 6.22.12 p. 152 6.23.4 p. 153-154 Table 6.1, 6.2 p. 179 7.10.2, 7.10.8 p. 181-182 Tables 7.1, 7.2 p. 188-190 Tables 7.3-7.5
Amendment 6	Effective 21 June 2007	pp. 2-2A Document History	p. 5 Code Clause C2	

C1, C2, C3 and C4: Document History (continued)

	Date	Alterations		
Amendment 7	Effective 1 November 2008	pp. 2-2A Document History p. 5 Code Clause C2 p.17 Contents pp. 19-21 References pp. 29-32 Definitions p. 41 2.3.7 p. 43 Table 2.1 p. 81 3.17.1, 3.17.3 p. 89 3.17.15, 3.17.16 p. 96 4.2.4 Comment, 4.2.5 p. 97 4.5.4 p. 98 4.5.10, 4.5.11 p. 101 Table 4.1	p. 102 Table 4.1/1 p. 103 Table 4.1/2 p. 104 Table 4.1/3 p. 105 Table 4.1/4 p. 106 Table 4.1/5 p. 110 5.6.6 p. 111 5.6.13 p. 121 6.6.4, 6.7.1 p. 122 6.8.1 Comment p. 127 6.11.4 p. 141 6.19.7 p. 145 6.20.16, 6.20.17 p. 147 6.21.6	p. 149 6.22.6 p. 154 Table 6.2 p. 159 7.2.2 p. 173 7.8.5, Comment p. 180 7.11.2 pp. 201-203 Appendix A p. 205 Appendix B pp. 207-209 Appendix C p. 210 Appendix D pp. 213, 214, 218-221, 227, 228 Index
Amendment 8	Published 30 June 2010 Effective from 30 September 2010	p. 2A, Document History, Status p. 8, Code Clause C3 p. 19, References	p. 140, C/AS1 6.18.10 p. 210, Appendices D 1.1.2	
Amendment 9	Effective 10 October 2011	p. 2A, Document History, Status pp. 19-22, References p. 81, C/AS1 3.17.2	p. 115, C/AS1 5.18.10 p. 141, C/AS1 6.19.7 p. 208, Appendices C 7.1.1	

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 October 2011 and supersedes all previous versions of this document.

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

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References

Amend 9 Oct 2011

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

Standards New Zealand

Amend 7 Nov 2008

		Where quoted (Unless otherwise stated all references apply to **C/AS1**)
NZS 4232:-	Performance criteria for fire resisting closures	
Part 2: 1988	Fire resisting glazing systems	5.8.3 a), 5.8.4, Figure 5.1
Amend 7 Nov 2008 NZS 4503: 2005	Hand operated fire fighting equipment	A2.1 (Type 14)
Amend 8 Sep 2010 NZS 4510: 2008	Fire hydrant systems for buildings *Amend: 1*	A2.1 (Type 18)
NZS 4512: 2010	Fire detection and alarm systems in buildings	6.22.14 b) i), A2.1 (Type 9), C7.1.6 Amend 7 Nov 2008
Amend 4 Oct 2005 NZS 4515: 2009	Fire sprinkler systems for life safety in sleeping occupancies (up to 2000 m^2)	6.16.7, 6.18.10, D3.1.1, Table 7.5 Amend 5 Oct 2005
Amend 9 Oct 2011 NZS 4520: 2010	Fire resistant doorsets	5.8.1.0, 6.19.7 C7.1.1
Amends 4 and 7 Amend 8 Sep 2010 NZS 4541: 2007	Automatic fire sprinkler systems *Amend: 1*	6.16.7, 6.18.10, 6.19.9, 6.22.6, D2.1.1, Table 7.5 Amend 5 Oct 2005
Amend 3 Feb 2004 Amend 7 Nov 2008 NZS 5261: 2003	Gas installation *Amend: 1, 2*	9.2.1, 9.2.2
NZS 6104: 1981	Specification for emergency electricity supply in buildings	6.23.3
Amend 3 Feb 2004 NZS/BS 476:-	Fire tests on building materials and structures	
Part 20: 1987	Method for determination of the fire resistance of elements of construction (general principles) *Amend: 6587*	C6.1.1
Part 21: 1987	Methods for determination of the fire resistance of loadbearing elements of construction	C6.1.1
Part 22: 1987	Methods for determination of the fire resistance of non-loadbearing elements of construction	C6.1.1 Amend 7 Nov 2008

			Where quoted (Unless otherwise stated all references apply to **C/AS1**)	
	Standards Australia			
	AS 1366:-	Rigid cellular plastics sheets for thermal insulation	Table 6.3	
	Part 1: 1992	Rigid cellular polyurethane (RC/PUR) *Amend: 1*		
	Part 2: 1992	Rigid cellular polyisocyanurate (RC/PIR)		
	Part 3: 1992	Rigid cellular polystyrene – Moulded (RC/PS-M) *Amend: 1*		
	Part 4: 1989	Rigid cellular polystyrene – Extruded (RC/PS-E)		
	AS 1530:-	Methods for fire tests on building materials, components and structures		Amend 7 Nov 2008
	Part 1: 1994	Combustibility test for materials	C5.1.1	
	Part 2: 1993	Test for flammability of materials	C3.1.1, C4.1.1	Amend 7 Nov 2008
Amend 9 Oct 2011	Part 4: 2005	Fire-resistance tests of elements of construction	C6.1.1	
Amend 3 Feb 2004	AS 1691: 1985	Domestic oil-fired appliances – installation	9.3.1, 9.3.2	
	AS 2220:-	Emergency warning and intercommunication systems in buildings		
	Part 1: 1989	Equipment design and manufacture	A2.1 (Type 8)	
	Part 2: 1989	System design, installation and commissioning	A2.1 (Type 8)	
	AS 4072:-	Components for the protection of openings in fire-resistant separating elements		
Amend 9 Oct 2011	Part 1: 2005	Service penetrations and control joints	C6.1.2 b)	Amend 7 Nov 2008
	Joint Australian/New Zealand Standards			
	AS/NZS 1170:-	Structural Design Actions		
	Part 0: 2002	General principles		
Amend 7 Nov 2008	AS/NZS 1221: 1997	Fire Hose Reels *Amend: 1*	A2.1 (Type 14)	
	AS/NZS 1530:-	Methods for fire tests on building materials, components and structures		
	Part 3: 1999	Simultaneous determination of ignitability, flame propagation, heat release and smoke release	C4.1.1	Amend 7 Nov 2008
	AS/NZS 1668:-	The use of ventilation and air conditioning in buildings		
	Part 1: 1998	Fire and smoke control in multi-compartment buildings	3.7.1 b), 6.9.6, 6.21.2, A2.1 (Type 9), A2.1 (Type 13)	
Amend 9 Oct 2011	AS/NZS 2918: 2001	Domestic solid fuel burning appliances – installation	9.1.1, 9.1.2, 9.3.3, 9.5.6, 9.5.11 Comment	
Amend 3 Feb 2004	AS/NZS 3837: 1998	Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter	C8.1.1, C8.1.2, Table 7.5	Amend 7 Nov 2008

		Where quoted (Unless otherwise stated all references apply to **C/AS1**)
British Standards Institution		
BS 4790: 1996	Method for determination of the effects of a small source of ignition on textile floor coverings (hot metal nut method)	6.20.8, C2.1.1
BS 5287: 1996	Specification for assessment and labelling of textile floor coverings tested to BS 4790	6.20.8, C2.1.1

Amend 3 Feb 2004

Amend 7 Nov 2008

European Committee for Standardisation		
Eurocode DD ENV 1991-2-2: 1996		
Eurocode 1	Basis of design actions on structures	
Part 2.2	Actions on structures exposed to fire	Table 5.1 note 7
Building Research Establishment (UK)		
BRE Defect action sheet DAS 131: May 1989		
	External walls: Combustible external plastics insulation: Horizontal fire barriers	7.9.19 Comment 1
BRE Report 135: 1988		
	Fire performance of external thermal insulation for walls in multi-storey buildings. Rogowski B.F., Ramaprasad R., Southern J.R.	7.9.19 Comment 1
BRE Report 186: 1990		
	Design principles for smoke ventilation in enclosed shopping centres. Morgan and Gardner	6.21.3 Comment 6
BRE Report 258: 1992		
	Design approaches for smoke control in atrium buildings. Hansell and Morgan	6.21.3 Comment 6, 6.21.4 Comment 2

		Where quoted (Unless otherwise stated all references apply to **C/AS1**)	
National Fire Protection Association of America			
NFPA 92B: 1995	Guide for smoke management systems in malls, atria and large areas	Table 2.1 note 1, 5.6.12 Comment 1, 6.21.3 Comment 6	
NFPA 285: 1998	Standard method of test for the evaluation of flammability characteristics of exterior non load bearing wall assemblies containing components using the intermediate scale, multi-storey test apparatus	7.11.2 b)	
American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)			
Design of smoke management systems. Klote and Milke 1992		6.21.3 Comment 6	
International Conference of Building Officials: America			
Uniform Building Code Standard 4.1: 1997	Proscenium fire safety curtains	6.19.9 Comment 2	
Uniform Building Code Standard 26.2: 1997	Test method for the evaluation of thermal barriers	C9.1.3	Amend 7 Nov 2008
New Zealand Government			
Fire Safety and Evacuation of Buildings Regulations 2006		3.17.2 Comment 2	Amend 9 Oct 2011
Building Control Commission, State of Victoria, Australia			
Smoke management in large spaces in buildings: 1998. Milke and Klote		6.21.3 Comment 6	
New Zealand Electrical Code of Practice			
NZECP 54: 2001	Code of practice for the installation of recessed luminaries and auxiliary equipment	9.4.1	Amend 3 Feb 2004

iii) a self-closer that is activated by operation of a smoke detector but allows the door to swing freely at other times. The smoke detector requirements shall be the same as for a *hold-open device* (see Paragraph 3.17.10).

c) Fitted with panic bolts complying with Paragraph 3.17.14 and situated in accordance with Paragraph 3.17.16 or simple fastenings that can be readily operated from the side approached by people making an escape complying with Paragraph 3.17.15. Amend 7 Nov 2008

d) Not fitted with any locking devices unless they comply with Paragraph 3.17.2.

e) Have door handles which satisfy the requirements for use by *people with disabilities*.

f) *Constructed* to ensure that forces required to open the doors do not exceed 67 N to release the latch (where fitted), 133 N to set the door in motion, and 67 N to open the door to the minimum required width.

COMMENT:

D1/AS1 Paragraph 7.0 gives appropriate guidelines with respect to handle height and the need for single-handed lever action mechanism.

Locking devices

3.17.2 Where the *building* is occupied, locking devices shall:

a) Be clearly visible, located where such a device would be normally expected, designed to be easily operated without a key or other security device, and allow the door to open in the normal manner,

COMMENT:

Card access and keypad locks are examples of unacceptable security devices.

b) Not prevent or override the direct operation of panic bolts fitted to any door, and

c) If of an electromechanical type, in the event of a power failure or door malfunction, either:

i) automatically switch to the unlocked (fail-safe) condition, or

ii) be readily opened by an alternative method satisfying the requirements of Paragraph 3.17.2 a).

COMMENT:

1. There should be a place in a *building* management plan procedure, which has been approved by the *building consent authority*, to ensure that all *escape route* doors are unlocked when anybody is lawfully in the *building*. Amend 7 Nov 2008
2. Where people are held under restraint, alternative proposals must be consistent with the requirements of the "Fire Safety and Evacuation of Buildings Regulations 2006". Amend 9 Oct 2011
3. Where the method of operation of a locking device is not obvious, signage complying with NZBC Clause F8.3.1 should be provided to indicate the location and release procedure for the locking device. For example, pressing a button on a wall beside the door.
4. NZBC Clause C2.3.3 (b) requires *escape routes* to be "free of obstruction in the direction of escape". This does not prevent *owners*, for security purposes, locking *escape route* doors when the *building* is unoccupied.

Direction of opening

3.17.3 Doors on *escape routes* shall be hung to open in the direction of escape, and where escape may be in either direction doors shall swing both ways. These requirements need not apply where the number of occupants using the door is no greater than:

a) 20 in an *open path*, or

b) 10 into and within an *exitway* including *final exit* doors. Amend 7 Nov 2008

3.17.4 Doors used for the passage of beds in *purpose groups* SC and SD, shall be capable of swinging in both directions, and in the case of *purpose group* SC the doors shall be of sufficient width to allow the passage of a bed and essential patient life support equipment.

Degree and width of opening

3.17.5 Doors on *escape routes* (see Figure 3.25 shall satisfy all the following requirements:

a) In *open paths* provide an unobstructed opening width of no less than 760 mm, and when multi-leaf, have no single leaf less than 500 mm wide. The minimum door opening width may be reduced to 600 mm where it is not required to be an *accessible route*.

b) Within *exitways* (including entry and *final exit* doors), reduce the minimum *exitway* width (required by Paragraph 3.3.2), by no more than the 125 mm allowed under Paragraph 3.3.6 e).

c) Open no less than 90°.

d) Open onto a floor area which:

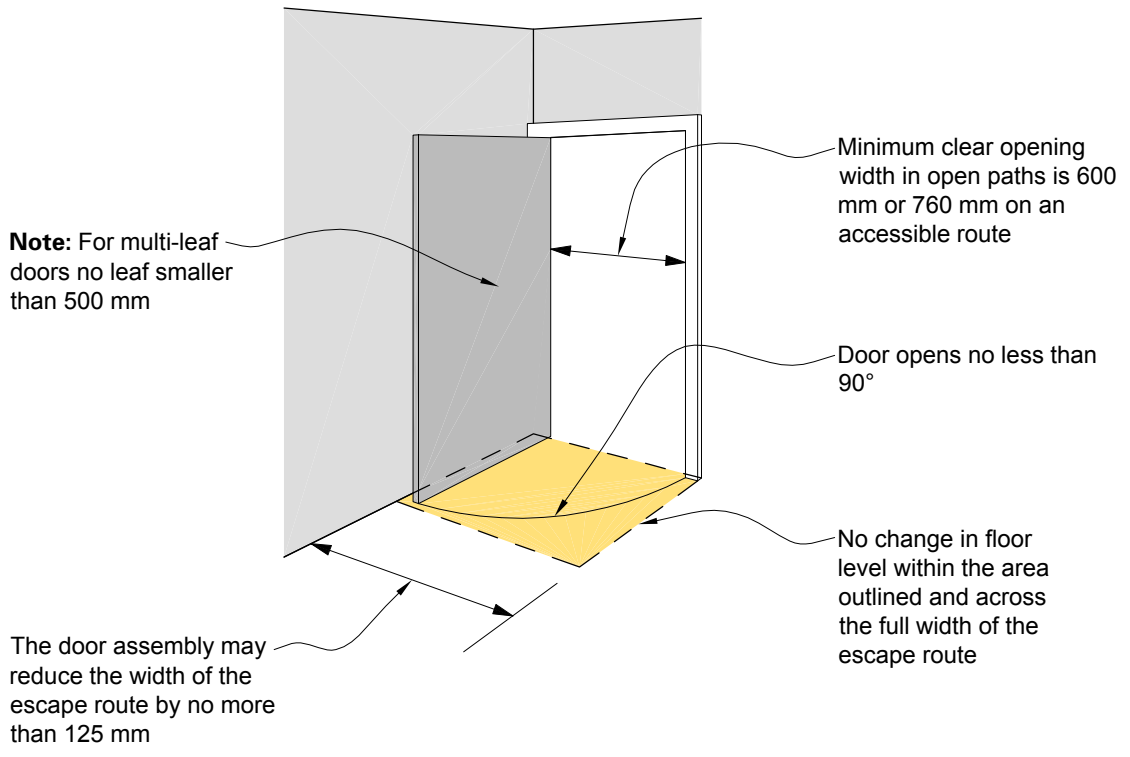
i) extends for a distance of no less than the arc of the door swing, and

ii) is at the same level on both sides of the door for the full width of the *escape route.*

COMMENT:
A 20 mm threshold weather stop is acceptable on external doors (see D1/AS1).

e) When opened, not cause the door swing to obstruct the minimum required width of any *escape route*. For example, doors which open onto a corridor used as an *escape route*, shall not obstruct the minimum required width of that *escape route*.

Figure 3.25: Degree and Width of Openings
Paragraphs 3.3.6 e) and 3.17.5



5.8.4 In calculating glazing dimensions from NZS 4232, Figure D1 shall be used with the lower *fire intensity* applying to all *purpose groups* except WH and WF to which the higher *fire intensity* shall apply. The assumed speed of travel in *safe paths* shall be no more than 0.6 m/s.

5.8.5 There is no restriction on the area of uninsulated *fire resisting glazing* located more than 2.0 m above floor level (see Figure 5.1 (b)).

COMMENT:

It is assumed that thermal radiation from glazing more than 2.0 m above floor level will not be a threat during the time it takes occupants to escape.

5.8.6 Where the *safe path* is glazed on both sides, the separation distance when applying Paragraph 5.8.3 a) needs to be calculated only from one side.

COMMENT:

It is assumed that a *fire* in its early stages of development will not have spread to *firecells* on both sides of the *safe path*. It is also assumed the *fire* will not occur within a *safe path*.

Concession for sprinklers

5.8.7 Where the *firecell* adjoining the *safe path* is sprinklered, the glazing area permitted by Paragraph 5.8.3 a) may be doubled.

5.8.8 Where, *firecells* (but not including a *safe path*) on both sides of a *fire separation* are sprinklered, the separation is permitted to have an unrestricted area of uninsulated *fire resisting glazing.*

This provision does not apply to glazing in proscenium walls (see Paragraph 6.19.11).

Smoke separations

5.8.9 There is no restriction on area of glazing in *smoke separations* (including *protected paths*). Non-*fire resisting glazing* may be used if it is toughened or laminated safety glass. Glazing shall have at least the same smoke stopping ability as the *smoke separation*.

Fire doors and smoke control doors

5.8.10 Glazing in *fire doors* shall be *fire resisting glazing* meeting the provisions of Table 6.1. Where an *insulation* value is required, an uninsulated vision panel may be used without downgrading the *insulation* value of the door. Vision panels shall comply with NZS 4520. Amend 9 Oct 2011

COMMENT:

1. Table 6.1 permits uninsulated *fire resisting glazing* only where *firecells* are sprinklered.
2. Uninsulated *fire resisting glazing* would include wired glass and some clear glasses. There are currently available clear glasses which can achieve an *insulation* rating.
3. NZS 4520 permits a single vision panel of area not exceeding 65,000 mm^2. Amend 9 Oct 2011

5.8.11 Glazing in *smoke control doors* shall meet the requirements of Paragraph 5.8.9 for *smoke separations.*

5.9 Structural Stability During Fire

Primary element loadings

5.9.1 To meet the Performances of NZBC C4, this acceptable solution provides for the structural *stability* of *primary elements* by requiring that they be *fire* rated to avoid premature failure.

5.9.2 During a *fire primary elements* shall, resist collapse under:

a) The design dead and live loads required by NZBC B1, and

b) Any additional loads caused by the *fire*.

COMMENT:

1. NZBC B1 Clause B1.3.3 (c) and (i) requires that structural *stability* take account of temperature and *fire* effects.
2. Additional loadings can arise from changes in length or other deformations in *building elements* as a result of high temperatures.

(Continued over page)

3. Except with timber members, yield strength generally reduces with temperature increase, so that strength reduction is related to the time for which the *primary element* is exposed to *fire*. Factors which need to be taken into account include the maximum temperature attained, the capacity of the element to absorb heat, potential loss of section, the degree of exposure, whether any applied coating is used to protect the element from the effects of *fire*, and the degree of restraint provided by the surrounding structure.

5.9.3 Factors influencing the necessary level of *fire* resistance include:

a) *Fire* severity

b) *Building height*

c) Total *fire load*

d) *Purpose group*

e) *Occupant load*

f) Capability of a local Fire Service

g) Availability of a water supply

h) Level of *fire safety precautions* installed in the *building*.

Unrated primary elements

5.9.4 In nearly all cases (see Paragraph 5.1) *primary elements* are rated for *stability*, and sometimes for *integrity* and *insulation*. However, *primary elements* need not be rated where any of the following circumstances exist:

a) They are located outside an *external wall* which is 2.0 m or more from the *relevant boundary,* and are shielded from the effects of *fire* by protected areas of the wall (see Figure 5.2), or can be shown by *fire* engineering design to retain *stability* when subjected to thermal radiation and/or flame impingement as appropriate.

COMMENT:

To be shielded from the effects of an internal *fire* by protected areas of the *external wall, primary elements* should be placed within a 45° triangle formed in plan by lines drawn from the edges of *unprotected areas* on each side of the element. An alternative approach is to apply a method for determining the *stability* of *primary elements* outside the *external wall* contained in "Fire-safe structural steel – A design guide" – American Iron and Steel Institute. This approach is applicable to *primary elements* of any material.

b) They are added to strengthen an existing *building* and are required only to carry horizontal loads induced by wind or earthquake.

COMMENT:

1. Usually frame action provides *stability* for the vertical and horizontal loads, and the two are therefore inseparable, but, when strengthening earthquake risk *buildings* for example, structural elements may be required only to withstand horizontal loading.

2. It is assumed that an earthquake will not occur during a *fire*.

c) They are part of a *building* which is more than 1.0 m from the *relevant boundary* and contains only *purpose group* SH.

COMMENT:

Table 4.1 allows zero *F rating* for single floor *firecells*, provided other *fire safety precautions* are adopted. However, Paragraph 6.2.1 requires those *firecells* to be separated from each other by *fire separations* with a *FRR* of no less than 30/30/30.

Amend 4
Oct 2005

COMMENT:
In multi-floor *buildings* thermal gradients exist in internal shafts resulting from atmospheric conditions outside the *building*. There will be a neutral pressure point somewhere about the mid-height, above which there may be air flow from the shaft into the floors. *Doorsets* opening into these shafts should not have large gaps at the sill which would otherwise be acceptable in *doorsets* in *escape routes*. This effect is negligible in low *buildings*.

Fire door and smoke control door installation

6.19.5 *Fire doors* and *smoke control doors* shall be installed in accordance with Paragraph 3.17.

Doorset markings

6.19.6 *Doorsets* shall be clearly marked to show their *FRR* and where required to show their smoke stopping capability**.**

COMMENT:
A door marked -/60/30 Sm would be a *fire door* with an *integrity* of 60 minutes, and an *insulation* of 30 minutes, which may be used as a *smoke control door*. A door marked -/-/- Sm would be a *smoke control door* only, with no *FRR*.

Amends 7 and 9

6.19.7 Markings and labelling shall in all other respects comply with NZS 4520.

Glazing in doors

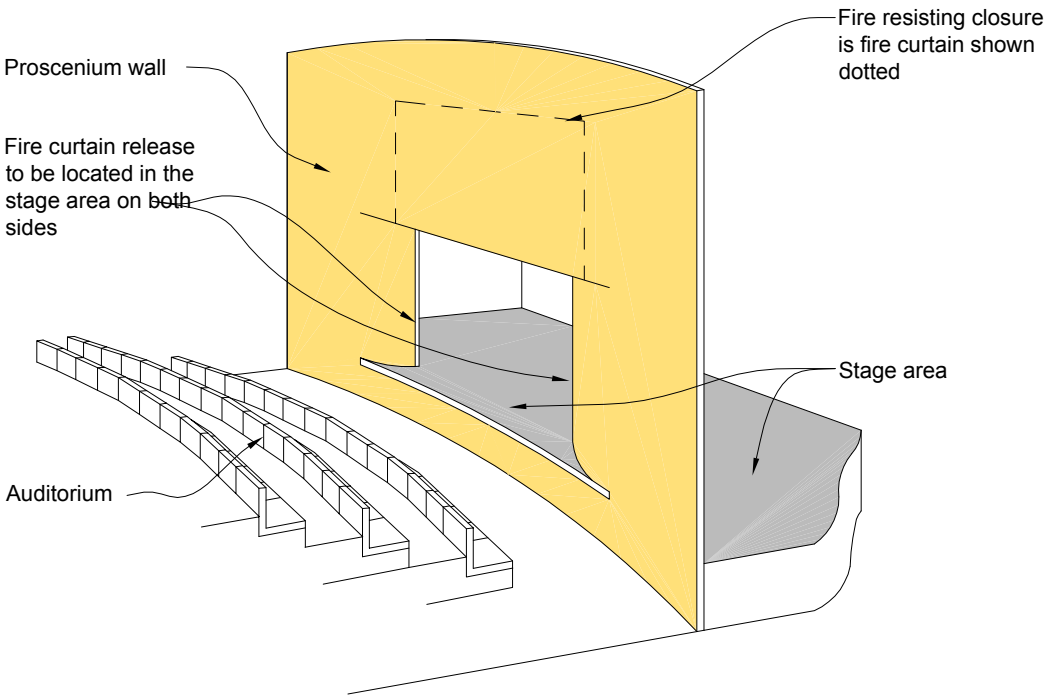
6.19.8 Glazing in *fire doors* and *smoke control doors* shall comply with Paragraphs 5.8.10 and 5.8.11.

Theatre proscenium walls

6.19.9 The *fire resisting closure* (see Figure 6.13) to the stage opening in a *fire* rated proscenium wall shall be an approved *fire* curtain. Where the auditorium, stage area, and all spaces used for support activities are sprinklered, sprinklers, or drenchers complying with NZS 4541 Clause 514.1, shall be installed above the proscenium opening and be located so that both sides of the *fire* curtain are kept wet in the event of *fire*.

COMMENT:
1. See Paragraph 6.3.1 for determining when the proscenium wall should be *fire* rated. See Paragraph 6.3.2 a) and Table 4.1 for determining when sprinklers are required.
2. Uniform Building Code Standard 4-1 is an acceptable standard for the design and *construction* of a Proscenium Fire Safety Curtain.

Figure 6.13: Theatre Proscenium Walls
Paragraph 6.19.9



Notes:
1. Any glazing to proscenium wall shall be *insulated*.
2. Where the theatre is sprinkled, either sprinklers or drenchers shall be installed on both sides of the wall above the proscenium opening.

6.19.10 The *fire* curtain when released shall free fall, and overlap the opening to inhibit the passage of smoke and flames. An emergency curtain release device shall be located in the stage area on both sides of the opening.

6.19.11 Uninsulated glazing is not permitted in proscenium walls.

Protected shaft access panels

6.19.12 Access panels to *protected shafts* shall have the *fire* resistance and smoke control performance appropriate to their location as required by Table 6.1. They shall be capable of being opened only with a special tool.

Lift landing doors

6.19.13 *Doorsets* (lift landing doors) opening into lift shafts which are *protected shafts* shall be *fire doors* complying with Table 6.1. The *FRR* is based on the rating for the *protected shaft*. Table 6.1 describes how this is applied and the requirements for *insulation* and smoke control. Lift landing doors need not be *fire* rated from the shaft side.

Amend 4
Oct 2005

COMMENT:
This requirement does not apply to lifts meeting the provisions of Paragraph 3.12.3 for a passenger lift within a vertical *safe path*.

Appendix C: Test Methods

C1.1 General

C1.1.1 This Appendix contains test methods for confirming that specific *building elements* satisfy relevant provisions of the Fire Safety Approved Documents. It includes both established *standard tests* and other test methods for *building elements* in situations where *standard tests* are unavailable.

C2.1 Flammability of Floor Coverings

C2.1.1 Materials shall be classified according to BS 5287 when tested to:

BS 4790 Method for determination of the effects of a small source of ignition on textile floor coverings (hot metal nut method).

C3.1 Flammability of Suspended Flexible Fabrics and Membrane Structures

Amend 7 Nov 2008

C3.1.1 Materials shall be assigned a *flammability index* when tested to:

AS 1530 Methods for fire tests on building materials and structures – Part 2: Test for flammability of materials.

Amend 7 Nov 2008

C4.1 Properties of Lining Materials

Amend 7 Nov 2008

Amend 7 Nov 2008

C4.1.1 Materials shall be assigned:

a) An *ignitability index,*

b) A *spread of flame index,*

c) A heat evolved index,

d) A *smoke developed index,*

when tested to:

AS/NZS 1530 Methods for fire tests on building materials, components and structures – Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release.

C5.1 Non-combustibility of Materials

Amend 7 Nov 2008

C5.1.1 Materials shall be classified as *non-combustible* or *combustible* when tested to:

AS 1530 Methods for fire tests on building materials and structures – Part 1: Combustibility test for materials.

C6.1 Fire Resistance

Amend 7 Nov 2008

C6.1.1 *Primary* and *secondary elements,* closures and *fire stops* shall be assigned a *fire resistance rating (FRR)* when tested to:

AS 1530 Methods for fire tests on building materials and structures – Part 4: Fire resistance tests of elements of building construction; or

NZS/BS 476 Fire tests on building materials and structures – Parts 20 to 22. Test methods for determining the fire resistance of elements of construction.

Amend 7 Nov 2008

C6.1.2 *Fire stops* shall be tested:

a) In circumstances representative of their use in service, paying due regard to the size of expected gaps to be stopped, and the nature of the *fire separation* within which they are to be used, and

b) In accordance with AS 4072: Part 1, Service penetrations and control joints.

C7.1 Fire Resisting Closures and Smoke Control Doors

Amend 7 Nov 2008

C7.1.1 *Fire resisting closures* shall be evaluated in circumstances representative of their use in service, and shall comply with NZS 4520 Fire-resistant doorsets.

Amend 9 Oct 2011

Frictional forces

Amend 7 Nov 2008

C7.1.2 The forces required to open any *fire door* or *smoke control door,* on an *escape route***,** shall not exceed 67 N to release the latch, 133 N to set the door in motion, and 67 N to open the door to the minimum required width. These forces shall be applied at the latch stile. These requirements do not apply to horizontal sliding doors in SD *purpose group,* or power-operated doors.

Amend 7 Nov 2008

C7.1.3 *Smoke control doors* shall comply with Paragraphs C7.1.4 to C7.1.6.

Self-closing provision

Amend 7 Nov 2008

C7.1.4 As required by Paragraph 3.17.1:

a) All door leaves shall be self-closing, and

b) Provision shall be made for the self-closing device to be adjustable during commissioning to satisfy the requirements of Paragraph C7.1.2 after installation.

Amend 7 Nov 2008

C7.1.5 Where it is desirable in normal circumstances for a *fire door* or *smoke control door* to operate freely, it is acceptable to use a self-closer mechanism which activates in the event of *fire* but does not operate at other times.

COMMENT:

1. These circumstances can occur where people are under care. Leaving the door to the occupant's room (or *suite*) open, reduces that occupant's feeling of isolation and permits ready observation by staff.
2. Self-closers can be an obstruction to the elderly and *people with disabilities,* who have difficulty in opening the door against the pressure applied by the self-closer.

Automatic smoke-sensing devices

Amend 7 Nov 2008

C7.1.6 Automatic smoke-sensing devices complying with NZS 4512, if used, shall be positioned within the stream of air that passes the door opening when the *smoke control door* is fully open.

C8.1 Fire Properties of External Wall Cladding Systems

Amend 7 Nov 2008

C8.1.1 *Fire* properties of *external wall* cladding systems shall be determined in accordance with:

AS/NZS 3837 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.

Amend 7 Nov 2008

C8.1.2 In addition to meeting the general requirements of AS/NZS 3837, testing shall also be in accordance with the following specific requirements:

a) An applied external heat flux of 50 kW/m^2,

b) A test duration of 15 minutes,

c) The total heat release measured from start of the test,

d) Sample orientation horizontal, and

e) Ignition initiated by the external spark igniter.

Amend 7 Nov 2008

C8.1.3 *External wall* cladding systems, which comprise only materials which individually are classified as *non-combustible,* may be deemed to satisfy all the requirements of Table 7.5.

COMMENT:

The *non-combustible* classification represents a more onerous performance level than those required by Table 7.5, and is therefore acceptable. A *non-combustible* classification may be claimed only if the respective materials have been subjected to testing as described in Paragraph C6.1.