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Compliance Document for New Zealand Building Code Clause F6 Visibility in Escape Routes – Second Edition

Prepared by the Department of Building and Housing

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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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Status of Compliance Documents

Compliance Documents are prepared by the Department of Building and Housing in accordance with section 22 of the Building Act 2004. A Compliance Document is for use in establishing compliance with the New Zealand Building Code.

A person who complies with a Compliance Document will be treated as having complied with the provisions of the Building Code to which the Compliance Document relates. However, a Compliance Document is only one method of complying with the Building Code. There may be alternative ways to comply.

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 of the Building Code and in the Definitions at the start of this Compliance Document.

F6: Document History

	Date	Alterations	
First published	July 1992		
Amendment 1	1 December 1995	pp. i and ii, Document History p. iii, F6.3.1 p. v, Contents p. vi, References	p. 3, 1.2.1, 1.3 pp. 4 and 5, Table A1 p. 7, Index
Reprinted incorporating Amendment 1	July 1996		
Second edition	1 December 2000 Effective from 1 June 2001	Document revised – second edition issued	
Amendment 1	21 June 2007	Name of Compliance Document amended throughout pp. 3 and 4, new Building Code Clause F6	

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 21 June 2007 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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New Zealand Building Code Clause F6 Visibility in Escape Routes

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 Visibility in Escape Routes is F6.

Building Amendment Regulations 2007 SR2007/124

6 New clause F6 of Schedule 1 substituted

(1) Schedule 1 is amended by revoking clause F6 and substituting the following clause:

Clause F6–Visibility in escape routes

Provisions	Limits on application
Objective	
F6.1 The objective of this provision is to help safeguard people from injury in *escape routes* during failure of the main lighting.	
Functional requirement	
F6.2 *Specified features* in *escape routes* must be made *reasonably visible* by lighting systems, other systems, or both, during failure of the main lighting.	Requirement F6.2 does not apply to *Detached Dwellings, household units* within *Multi-unit Dwellings*, *Outbuildings*, or *Ancillary buildings*.
Performance	
F6.3.1 *Specified features* in *escape routes* must, when the systems for visibility are at their design level, be *reasonably visible*.	Performance F6.3.1 does not apply to *specified features* in the initial 20 metres of an *escape route* if the risk of injury, or impediment to movement of people, due to the *specified features* not being visible is low (for example, because people are familiar with the *escape route*, the *escape route* is level, and people do not require assistance to escape).
F6.3.2 The systems for visibility must operate to the following percentages of their design levels within the following times after failure of the main lighting: (a) 80% in 0.5 seconds in locations (examples of which are given by performance F6.3.3) where there is a high risk of injury due to delay in operation of the systems for visibility; and (b) 10% in 0.5 seconds, and 80% in 30 seconds, in stairs and in locations that are unfamiliar to users; and (c) 10% in 20 seconds, and 80% in 60 seconds, in all other locations.	
F6.3.3 Examples of locations (referred to in performance F6.3.2(a)) where there is a high risk of injury due to delay in operation of the systems for visibility include:	

Amend 1
Jun 2007

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Provisions	Limits on application
(a) areas where dangerous machinery is installed: (b) areas where hazardous processes take place: (c) clinical areas of hospitals: (d) prisons and other *buildings* in which people are detained: (e) any part of an *escape route* designed for use at any time by more than 250 people.	
F6.3.4 The systems for visibility must operate continuously in *buildings* or parts of *buildings* in the following risk groups for the following periods after failure of the main lighting: (a) *risk group A*, until restoration of the main lighting system: (b) *risk group B*, 90 minutes: (c) *risk group C*, 30 minutes.	
F6.3.5 Despite performance F6.3.4, if a *building* or part of a *building* falls into both *risk group A* and *risk group B*, the systems for visibility must operate for whichever is the longer of the periods specified in performance F6.3.4(a) and (b).	
F6.3.6 Signs to indicate escape routes must be provided as required by Clause F8 "Signs".	

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References

For the purposes of New Zealand Building Code compliance, acceptable reference documents include only the quoted edition and specific amendments listed below.

		Where quoted
Standards New Zealand		
NZS 380: 1968	Specification for flameproof electric lighting fittings	AS1 1.1.2 b)
NZS 4332: 1997	Non-domestic passenger and goods lifts	AS1 1.1.3
NZS 6104: 1981	Specification for emergency electricity supply in buildings	AS1 1.1.6
NZS 6703: 1984	Code of practice for interior lighting design	VM1 1.1.1
NZS 6742: 1971	Code of practice for emergency lighting in buildings	AS1 1.1.5
Standards Australia		
AS/NZS 2293:-	Emergency evacuation lighting for buildings	
Part 1: 1995	System design, installation and operation	AS1 1.1.2 a)
Part 2: 1995	Inspection and maintenance	AS1 1.1.2 a)
Part 3: 1995	Emergency luminaires and exit signs	AS1 1.1.2 a)
National Fire Protection Association of America		
NFPA 92B: 1995	Guide for smoke management systems in malls, atria and large areas	AS1 Table 2.1 (Note 1)

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Definitions

See Approved Document C/AS1 for the full list of fire safety definitions.

Adequate *Adequate* to achieve the objectives of the *building code*.

Building has the meaning ascribed to it by the Building Act 1991.

Escape height The height between the floor level in the *firecell* being considered and the floor level of the required *final exit* which is the greatest vertical distance above or below that *firecell*.

COMMENT:

1. It is necessary only to use the greatest height to the exits required for the *firecell* being considered, even though the *building* may have other *final exits* at lower or higher levels.
2. Where the *firecell* contains *intermediate floors*, or upper floors within *household units* the *escape height* shall be measured from the floor having the greatest vertical separation from the *final exit*.

Escape route A continuous unobstructed route from any *occupied space* in a *building* to a *final exit* to enable occupants to reach a *safe place*, and shall comprise one or more of the following: *open paths, protected paths* and *safe paths*.

COMMENT:

Doors are not obstructions in an *escape route* provided they comply with C/AS1 Part 3 and D1/AS1.

Evacuation time The time taken by the occupants of the *building* to evacuate the *building* to a *final exit*.

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 (e.g. when cantilevered). Note also that internal floors between *firecells* are *fire separations.*

Illuminance The luminous flux falling onto a unit area of surface.

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

a) Multiplying the number of people per m^2 (occupant density) for the activity being undertaken, by the total floor area, or

b) For sleeping areas, counting the number of beds, or

c) For fixed seating areas, counting the number of seats.

Purpose group The classification of spaces within a *building* according to the activity for which the spaces are used.

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Verification Method F6/VM1

1.1 Illuminance

1.1.1 An acceptable verification method for the measurement of *illuminance* is contained in NZS 6703 Section 11.

1.1.2 Measurements shall be made on the horizontal plane at floor level. The measurements shall be made in areas unobstructed by objects likely to affect the reading. Obstructions, such as furniture shall be removed.

1.1.3 Measurements shall not be made within 500 mm of vertical surfaces. Minimum *illuminances* will generally occur furthest from the luminaire(s) and at least four measurements shall be made around each luminaire on both axes. If the layout of luminaires is symmetrical, the number of measurements may be reduced.

COMMENT:
The measurement of the minimum *illuminance* is necessary to check compliance with the New Zealand Building Code, or to reveal the need for maintenance or replacement in an existing installation.

1.1.4 Daylight or spill light from adjacent rooms shall be excluded, and lamps switched on and allowed to stabilize.

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Acceptable Solution F6/AS1

1.1 Emergency Lighting Location and Installation

Location

1.1.1 Emergency lighting in *buildings* shall be provided as appropriate for the *escape height, occupant load* and *purpose group*. Compliance with Table 4.1 in Approved Document C/AS1 satisfies this requirement.

COMMENT:
Emergency lighting requirements are given in acceptable solution C/AS1, Table 2.1. Those requirements are based on the activities performed within the *building* and the associated assessed risk to occupants escaping from *fire*. The assessed risk takes account of *purpose group, occupant load, escape height* and the familiarity occupants are likely to have with respect to *building* layout. As a result, in many cases emergency lighting is required only in *exitways*.

Installation

1.1.2 An emergency lighting installation shall comply with:

a) AS/NZS 2293: Parts 1, 2 and 3, and

b) NZS 380, and

c) NZBC G9 Electricity.

Duration of illuminance

1.1.3 In no case shall the time of *illuminance* be less than:

a) 120 minutes for *purpose groups* SC and SD.

b) 60 minutes for *purpose groups* SA and SR.

c) 60 minutes for *purpose groups* CL, CO, CM, WL, WM, WF and WH when the *occupant load* exceeds 1000.

d) 30 minutes under any circumstances where emergency lighting is required.

COMMENT:
Lighting for emergency in lifts is contained in NZS 4332.

Table 2.1

1.1.4 For convenience, Table 2.1 from Approved Document C/AS1, is included in this acceptable solution to provide *purpose group* descriptions.

Maintenance

1.1.5 Existing systems installed in accordance with NZS 6742 shall be maintained in accordance with that Standard. Such systems therefore require fortnightly and monthly inspections.

Generators

1.1.6 Where emergency power is supplied by a generator to emergency lighting systems, the emergency power supply system shall be installed and maintained in accordance with NZS 6104 (see Paragraph 6.23.3 of C/AS1). Diesel generator central power sources are acceptable for emergency lighting systems. NZS 6104 requires that the emergency plant shall be such that full operational speed may be attained and initial load applied within 15 seconds from the initiating signal, and that the emergency lighting system has priority as the initial load.

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Table 2.1: Purpose Groups
(Taken from Part 2 of C/AS1)

Purpose group	Description of intended use of the building space	Some examples	Fire hazard category
CROWD ACTIVITIES			
CS or CL	For *occupied spaces*. CS applies to *occupant loads* up to 100 and CL to *occupant loads* exceeding 100.	Cinemas when classed as CS, art galleries, auditoria, bowling alleys, churches, clubs (non-residential), community halls, court rooms, dance halls, day care centres, gymnasia, lecture halls, museums, eating places (excluding kitchens), taverns, enclosed grandstands, indoor swimming pools.	1
		Cinemas when classed as CL, schools, colleges and tertiary institutions, libraries (up to 2.4 m high book storage), nightclubs, restaurants and eating places with cooking facilities, theatre stages, opera houses, television studios (with audience).	2
		Libraries (over 2.4 m high book storage).	3
CO	Spaces for viewing open air activities (does not include spaces below a grandstand).	Open grandstands, roofed but unenclosed grandstand, uncovered fixed seating.	1
CM	Spaces for displaying, or selling retail goods, wares or merchandise.	Exhibition halls, retail shops.	2
		Supermarkets or other stores with bulk storage/ display over 3.0 m high.	4
SLEEPING ACTIVITIES			
SC	Spaces in which *principal users* because of age, mental or physical limitations require special care or treatment.	Hospitals. Care institutions for the aged, children, *people with disabilities*.	1
SD	Spaces in which *principal users* are restrained or liberties are restricted.	Care institutions, for the aged or children, with physical restraint or detention. Hospital with physical restraint, detention quarters in a police station, prison.	1
SA	Spaces providing transient accommodation, or where limited assistance or care is provided for *principal users*.	Motels, hotels, hostels, boarding houses, clubs (residential), boarding schools, dormitories, halls, *wharenui*, community care institutions.	1
SR	Attached and multi-unit residential dwellings.	Multi-unit dwellings or flats, apartments, and includes *household units* attached to the same or other *purpose groups*, such as caretakers' flats, and residential accommodation above a shop. *Household unit firecells* may contain garages which are used exclusively by the occupants of that *household unit*.	1
SH	Detached dwellings where people live as a single household or family.	Dwellings, houses, being *household units,* or *suites* in *purpose group* SA, separated from each other by distance. Detached dwellings may include attached self-contained *suites* such as granny flats when occupied by a member of the same family, and garages whether detached or part of the same *building* and are primarily for storage of the occupants' vehicles, tools and garden implements.	1

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Table 2.1: Purpose Groups (contd)
(Taken from Part 2 of C/AS1)

Purpose group	Description of intended use of the building space	Some examples	Fire hazard category
WORKING, BUSINESS OR STORAGE ACTIVITIES			
WL	Spaces used for working, business or storage – low *fire load*.	Manufacturing, processing or storage of *non-combustible* materials, or materials having a slow heat release rate, cool stores, covered cattle yards, wineries, grading or storage or packing of horticultural products, wet meat processing.	1
		Banks, hairdressing shops, beauty parlours, personal or professional services, dental offices, laundry (self-service), medical offices, business or other offices, police stations (without detention quarters), radio stations, television studios (no audience), small tool and appliance rental and service, telephone exchanges, dry meat processing.	2
WM	Spaces used for working, business or storage – medium *fire load* and slow/medium/fast *fire* growth rates (e.g. <1 MW in 75 sec) **(Note 1)**	Manufacturing and processing of *combustible* materials not otherwise listed, including bulk storage up to 3 m high (excluding *foamed plastics*).	3
WH	Spaces used for working, business or storage – high *fire load* and slow/medium/fast *fire* growth rates (e.g. <1 MW in 75 sec) **(Note 1)**	Chemical manufacturing or processing plants, distilleries, feed mills, flour mills, lacquer factories, mattress factories, rubber processing plants, spray painting operations, plastics manufacturing, bulk storage of *combustible* materials over 3 m high (excluding *foamed plastics*).	4
WF	Spaces used for working, business or storage – medium/high *fire load* and ultra fast *fire* growth rates (e.g. >1 MW in 75 sec) **(Note 1)**	Areas involving significant quantities of highly *combustible* and flammable or explosive materials which because of their inherent characteristics constitute a special *fire hazard*, including: bulk plants for flammable liquids or gases, bulk storage warehouses for flammable substances, bulk storage of *foamed plastics*.	4 (The critical factor in this *purpose group* is the rate of *fire* growth.)
INTERMITTENT ACTIVITIES			
IE	*Exitways* on *escape routes*.	*Protected path, safe path.*	1
IA	Spaces for intermittent occupation or providing intermittently used support functions – low *fire load*.	Car parking, garages, carports, enclosed corridors, unstaffed kitchens or laundries, lift shafts, locker rooms, linen rooms, open balconies, *stairways* (within the *open path*), toilets and amenities, and service rooms incorporating machinery or equipment not using solid-fuel, gas or petroleum products as an energy source **(Note 2)**.	1
ID	Spaces for intermittent occupation or providing intermittently used support functions – medium *fire load*.	Maintenance workshops and service rooms incorporating machinery or equipment using solid-fuel, gas or petroleum products as an energy source **(Note 2)**.	3

Notes:

1. Refer to NFPA 92B for more information on *fire* growth rates.
2. Service rooms are spaces designed to accommodate any of the following: boiler/plant equipment, furnaces, incinerators, refuse, caretaking/cleaning equipment, airconditioning, heating, plumbing or electrical equipment, pipes, lift/escalator machine rooms, or similar services.

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References are to Paragraphs or tables.

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