

Compliance Document for New Zealand Building Code Clause F4 Safety from Falling – Second Edition

Prepared by the Department of Building and Housing

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

F4: Document History			
	Date	Alterations	
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Amendment 1	September 1993	p. 3, 1.2.1	p. 4, 2.0.1
Amendment 2	19 August 1994	pp. i and ii, Document History p. 3, 1.1.1, 1.2.1	p. 3, Table 1, Table 2 p. 5, Index
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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 6 January 2002 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

New Zealand Building Code

Clause F4 Safety from Falling

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 Safety from Falling is F4.

Amend 4
Jan 2002

FIRST SCHEDULE—continued	
Clause F4—SAFETY FROM FALLING	
Provisions	Limits on application
OBJECTIVE	
F4.1 The objective of this provision is to safeguard people from injury caused by falling.	
FUNCTIONAL REQUIREMENT	
F4.2 Buildings shall be constructed to reduce the likelihood of accidental fall.	
PERFORMANCE	
F4.3.1 Where people could fall 1 metre or more from an opening in the external envelope or floor of a <i>building</i> , or from a sudden change of level within or associated with a <i>building</i> , a barrier shall be provided.	Performance F4.3.1 shall not apply where such a barrier would be incompatible with the <i>intended use</i> of an area, or to temporary barriers on <i>construction</i> sites where the possible fall is less than 3 metres or to <i>buildings</i> providing pedestrian access in remote locations where the route served presents similar natural hazards.
F4.3.2 Roofs with permanent access shall have barriers provided.	
F4.3.3 Swimming pools have a depth of water exceeding 400mm, shall have barriers provided.	Performance F4.3.3 shall not apply to any pool exempted under section 5 of the Fencing of Swimming Pools Act 1987.
F4.3.4 Barriers shall:	
(a) Be continuous and extend for the full extent of the hazard,	
(b) Be of appropriate height,	
(c) Be constructed with <i>adequate</i> rigidity,	
(d) Be of <i>adequate</i> strength to withstand the foreseeable impact of people and, where appropriate, the static pressure of people pressing against them.	
(e) Be constructed to prevent people from falling through them, and	

Amend 4
Jan 2002

FIRST SCHEDULE—*continued***Provisions**

- (f) In the case of a swimming pool, restrict the access of children under 6 years of age to the pool or the immediate pool area.
- (g) Restrict the passage of children under 6 years of age when provided to guard a change of level in areas likely to be frequented by them.

F4.3.5 Barriers to swimming pools shall have in addition to performance F4.3.4:

- (a) All gates and doors fitted with latching devices not readily operated by children, and constructed to automatically close and latch when released from any stationary position 150 mm or more from the closed and secured position, but excluding sliding and sliding-folding doors that give access to the immediate pool surround from a *building* that forms part of the barrier, and
- (b) No permanent objects on the outside of the barrier that could provide a climbing step.

Limits on application

Performance F4.3.4 (f) shall not apply to any pool exempted under section 5 of the Fencing of Swimming Pools Act 1987.

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References

For the purposes of New Zealand Building Code compliance, referenced documents shall be deemed to include any amendments issued prior to the date of the Approved Document as displayed at the foot of the page on which the references are listed.

New Zealand Legislation

Fencing of Swimming Pools Act 1987

Where quoted

AS1 3.1.1

Definitions

This is an abbreviated list of definitions for words or terms particularly relevant to this Approved Document. The definitions for any other italicised words may be found in the New Zealand Building Code Handbook.

Balustrade The infill parts of a barrier (typically between floor and top rail).

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

Intended use of a *building* includes:

- a) Any reasonably foreseeable occasional other use that is not incompatible with the *intended use*; and
- b) Normal maintenance; and
- c) Activities taken in response to *fire* or any other reasonably foreseeable emergency – but does not include any other maintenance and repairs or rebuilding.

Nosing The rounded projecting edge of a stair tread.

Pitch line The line joining the leading edge or *nosings* (if any) of successive stair treads within a single flight of stairs.

Verification Method F4/VM1

No specific test methods have been adopted for verifying compliance with the Performance of NZBC F4.

Acceptable Solution F4/AS1

1.0 Barriers in Buildings

1.1 Barrier heights

1.1.1 Acceptable minimum barrier heights are given in Table 1.

COMMENT:

A *handrail* can be constructed as an integral part of a barrier. Refer to NZBC D1 "Access Routes".

1.2 Barrier construction

1.2.1 Buildings frequented by young children

Barriers located in any part of a *building* likely to be frequented by children under the age of 6 years shall have:

- a) No openings which will permit the passage of a sphere greater than given by Table 2, and
- b) No toeholds between the heights of 150 mm and 760 mm above floor level (or stair *nosings*), except that perforated sheet, mesh, or trellis rigidly fixed over the full barrier height is acceptable provided that openings have a maximum dimension (other than perimeter) of 50 mm.

COMMENT:

While 50 mm openings could offer a toehold to children, a continuous mesh of this size is difficult for a child to climb.

- c) The triangular opening formed by the riser, tread and bottom rail at the open side of a *stairway* shall be of such a size that a 150 mm diameter sphere cannot pass through it.

COMMENT:

Where barriers are provided for protection at a change of level in any *building* classified as Housing they will need to be constructed to restrict children under 4 years of age. Commercial *buildings* containing shops or health care facilities are also likely to need barriers that will restrict young children as will some Communal Residential and Communal Non-residential *buildings* such as motels and museums.

1.2.2 Low risk areas

In areas used exclusively for emergency or maintenance purposes in *buildings*, and in other *buildings* not frequented by children, barriers may have openings with maximum dimensions of either:

- a) 300 mm horizontally (between vertical balusters), or
- b) 460 mm vertically (between longitudinal rails).

1.2.3 These dimensional limitations apply also to any openable window or panel in a barrier.

Table 1: Minimum Barrier Heights
Paragraph 1.1.1

Building type	Location	Barrier height (mm) (Note 1)
Detached dwellings and within household units of multi-unit dwellings	Stairs, landings, ramps or edges of internal floors	900
	External deck or external balcony	1000
All other <i>buildings</i> , and common areas of multi-unit dwelling	Stairs or ramps	900
	All locations other than stairs or ramps	1000

Note:

- 1. Heights are measured vertically from floor level (ignoring floor coverings) on floors, landings and ramps, and from *pitch line* or stair *nosings* on *stairways*.
- 2. A landing is a platform with the sole function of providing access. A platform used as a space for people to congregate is described as a deck or balcony.

Table 2:	Acceptable Opening Sizes for Barriers (Note 1)	
Paragraphs 1.2.1 a), 4.0.2 b) c)		
Age group	Examples of application (Note 2)	Maximum sphere diameter (mm)
Children under 4	Housing, early childhood centres, shopping malls, health care facilities	100
Children of 4 and 5	Cinemas, motels, halls, churches, bridges with pedestrian access	130

Note:

- Opening size restrictions are chosen on the basis of child head and chest dimensional statistics.
- Because the barrier opening size is determined by the age and likely presence of children, and not by the classified use of the *building*, it is reasonable to expect different parts of a *building* to have different requirements. For example, in a public hall children may be expected in a public gallery, but not in a gallery reserved for lighting equipment or musicians. In shopping malls children are expected in public areas, but not in areas for the preparation of food or the unloading and reception of stock.

1.2.4 Balconies with fixed seating

Where a balcony or mezzanine floor accommodates fixed seating, a front barrier as shown in Figure 1 may be used as an alternative to Paragraph 1.2.1 and shall have:

- a) A minimum height of 700 mm above floor level,
- b) A horizontal projection extending at least 700 mm forward of the barrier at the top rail level, and
- c) No opening through which a 100 mm diameter sphere can pass.

COMMENT:

This solution is expected to be used mainly in places such as assembly halls, theatres and cinemas.

2.0 Construction Site Barriers

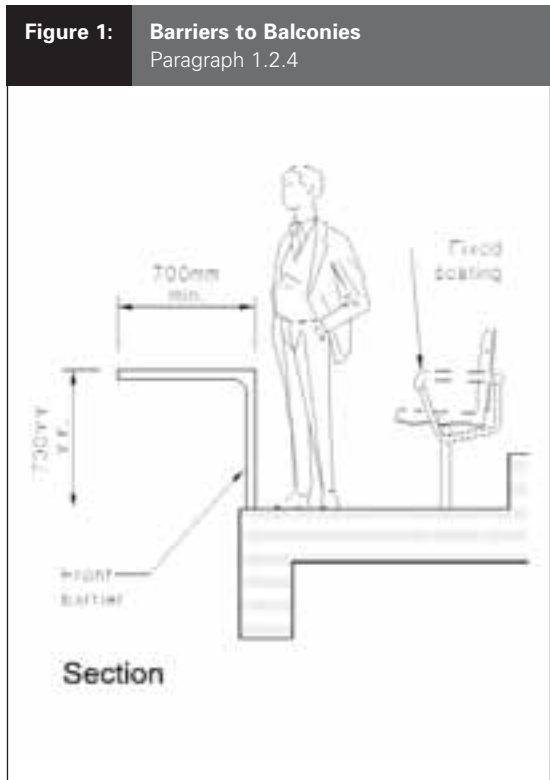
2.0.1 Construction site barriers shall have, in addition to a top rail, one or more intermediate rails or a suitable toeboard as described in Paragraph 2.0.3. Maximum rail spacing shall be 500 mm.

2.0.2 Scaffolding cross-bracing between standards within a single lift may be used as a top rail provided:

- a) The braces cross at a height of between 1000 mm and 1100 mm above the platform, and
- b) The platform is decked to within 200 mm of a vertical plane through the cross-bracing.

2.0.3 The mid-height rail is not necessary where the top rail is at the minimum height if a toeboard extending more than 225 mm above the platform is provided.

2.0.4 Each barrier rail shall be fixed as nearly as possible on a line vertically above the outer edge of the platform. In no case shall a rail be more than 200 mm beyond the platform edge.



3.0 Swimming Pool Barriers

3.1 Fencing

3.1.1 Fencing for swimming pools shall be constructed to no lesser standard than is required by the Schedule to the Fencing of Swimming Pools Act 1987, to restrict the access of children.

4.0 Opening Windows

4.0.1 Where the possible height of fall is 1.0 m or more, measured from the adjacent floor level, windows that open shall have:

- a) The lower edge of the opening no less than 760 mm above floor level, or
- b) A window opening restrictor fitted to limit the maximum dimension of the opening to 460 mm, or
- c) A 760 mm high barrier located in front of the window.

4.0.2 In any part of a *building* frequented by children under 6 years of age, where the possible height of fall is 1.0 m or more, measured from the adjacent floor level, windows that open shall have:

- a) The lower edge of the opening located no less than 760 mm above floor level and 610 mm above any toeholds, or
- b) A window opening restrictor fitted to limit the maximum opening to a size which prevents the passage of a sphere greater than given by Table 2, or
- c) A 760 mm high barrier located in front of the window, with the barrier having no toeholds above 150 mm from the floor, and with no openings that will allow the passage of a sphere greater than given by Table 2.

Index F4/VM1 & AS1

All references to Verification Methods and Acceptable Solutions are preceded by **VM** or **AS** respectively.

Balconies with fixed seating **AS1** 1.2.4, Figure 1

Barriers **AS1** 1.0

 construction **AS1** 1.2, 2.0.1, Table 2

 heights **AS1** 1.1, Table 1

 panels in barriers **AS1** 1.2.3

 scaffolding **AS1** 2.0.2

Children **AS1** 1.2.1, Table 2

Construction site barriers **AS1** 2.0

Low risk areas **AS1** 1.2.2

Swimming pools fencing **AS1** 3.0

Windows **AS1** 1.2.3, 4.0