

Compliance Document for New Zealand Building Code Clause F4 Safety from Falling – Third 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 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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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 24 September 2007 and supersedes all previous versions of this document.

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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.

FIRST SCHEDULE—continued	
Clause F4—SAFETY FROM FALLING	
Provisions	Limits on application
<p>OBJECTIVE</p> <p>F4.1 The objective of this provision is to safeguard people from injury caused by falling.</p> <p>FUNCTIONAL REQUIREMENT</p> <p>F4.2 <i>Buildings</i> shall be constructed to reduce the likelihood of accidental fall.</p> <p>PERFORMANCE</p> <p>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.</p> <p>F4.3.2 Roofs with permanent access shall have barriers provided.</p> <p>F4.3.3 Swimming pools have a depth of water exceeding 400mm, shall have barriers provided.</p> <p>F4.3.4 Barriers shall:</p> <ul style="list-style-type: none"> (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 	<p>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.</p> <p>Performance F4.3.3 shall not apply to any pool exempted under section 5 of the Fencing of Swimming Pools Act 1987.</p>

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, the acceptable 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.

New Zealand Legislation

Fencing of Swimming Pools Act 1987

Where quoted

AS1 1.2.7

Definitions

This is an abbreviated list of definitions for words or terms particularly relevant to this Compliance 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 sections 8 and 9 of the Building Act 2004.

Construct in relation to a *building*, includes to build, erect, prefabricate, and relocate; and **construction** has a corresponding meaning.

Handrail A rail to provide support to, or assist with the movement of, a person.

Household unit

- a) means any *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 one household; but
- b) does not include a hostel, boarding house or other specialised accommodation.

Intended use in relation to a *building*:

- a) includes any or all of the following:
 - i) Any reasonably foreseeable occasional other use that is not incompatible with the *intended use*; and
 - ii) Normal maintenance; and
 - iii) Activities taken in response to *fire* or any other reasonably foreseeable emergency
- b) 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.

Theatre A place of assembly intended for the production and viewing of performing arts, and consisting of an auditorium and stage with provision for raising and suspending stage scenery above and clear of the working area.

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 Minimum barrier heights are given in Table 1.

COMMENT:

Refer to NZBC Clause D1 for *handrails* on stairs. *Handrails* can be constructed as an integral part of a barrier.

1.2 Barrier construction

1.2.1 In housing and other areas likely to be frequented by children under 6 years of age:

- a) Figures 1-4 show acceptable barrier constructions
- b) Openings anywhere over the full height of the barrier shall be such a size that a 100 mm diameter sphere cannot pass through them, and
- c) The triangular opening formed by the riser, tread, and bottom rail of the barrier on a stair shall be of such a size that a 150 mm diameter sphere cannot pass through it (see Figure 4).

COMMENT:

1. *Buildings* classified as housing are always likely to be frequented by children under 6 years of age. However, 'Likely to be frequented' in regard to other *buildings* means something more than that children under 6 will be present from time to time. There should be an expectation that small children will be present on a regular basis (see Determination No. 2001/9 on www.dbh.govt.nz). Different parts of a *building* may have different barrier requirements, such as shopping malls where children under 6 are likely to frequent the public areas, but not the areas used for food preparation or the handling of stock.
2. The Clause F4.3.4(g) requirement that barriers restrict the passage of children under 6 years of age does not mean that all children under 6 must be unable to climb them. The Acceptable Solutions given here will prevent almost all children up to the age of 3 years from climbing. They can also be used as a guide for alternative designs.
3. Barriers with full height vertical members are the hardest for children to climb. Horizontal or near horizontal rails can easily be climbed by 2 year olds if the rails extend the full height of a barrier, even if the barrier includes a 200 mm wide top rail or if it slopes inwards at 15°.

Table 1: Minimum Barrier Heights
Paragraph 1.1.1, Figures 1-5

Building type	Location	Barrier height (mm) (Note 1)
Detached dwellings and within <i>household units</i> of multi-unit dwellings	Stairs and ramps and their landings	900
	Balconies and decks, and edges of internal floors or mezzanine floors	1000
All other <i>buildings</i> , and common areas of multi-unit dwellings	Stairs or ramps	900
	Barriers within 530 mm of the front of fixed seating	800
	All other locations	1100

Note:

1. Heights are measured vertically from finished floor level (ignoring carpet or vinyl, or similar thickness coverings) on floors, landings and ramps. On stairs the height is measured vertically from the *pitch line* or stair *nosings*.
2. A landing is a platform with the sole function of providing access.
3. Clause F4.3.1 has a limit on its application that may exclude the need for barriers in certain locations such as working wharves and loading docks.
4. An 800 mm high barrier in front of fixed seating would be appropriate in cinemas, *theatres*, and stadiums.

Figure 1: Barriers in areas likely to be frequented by children under 6 years of age – mesh and composite
Paragraph 1.2.1 a)

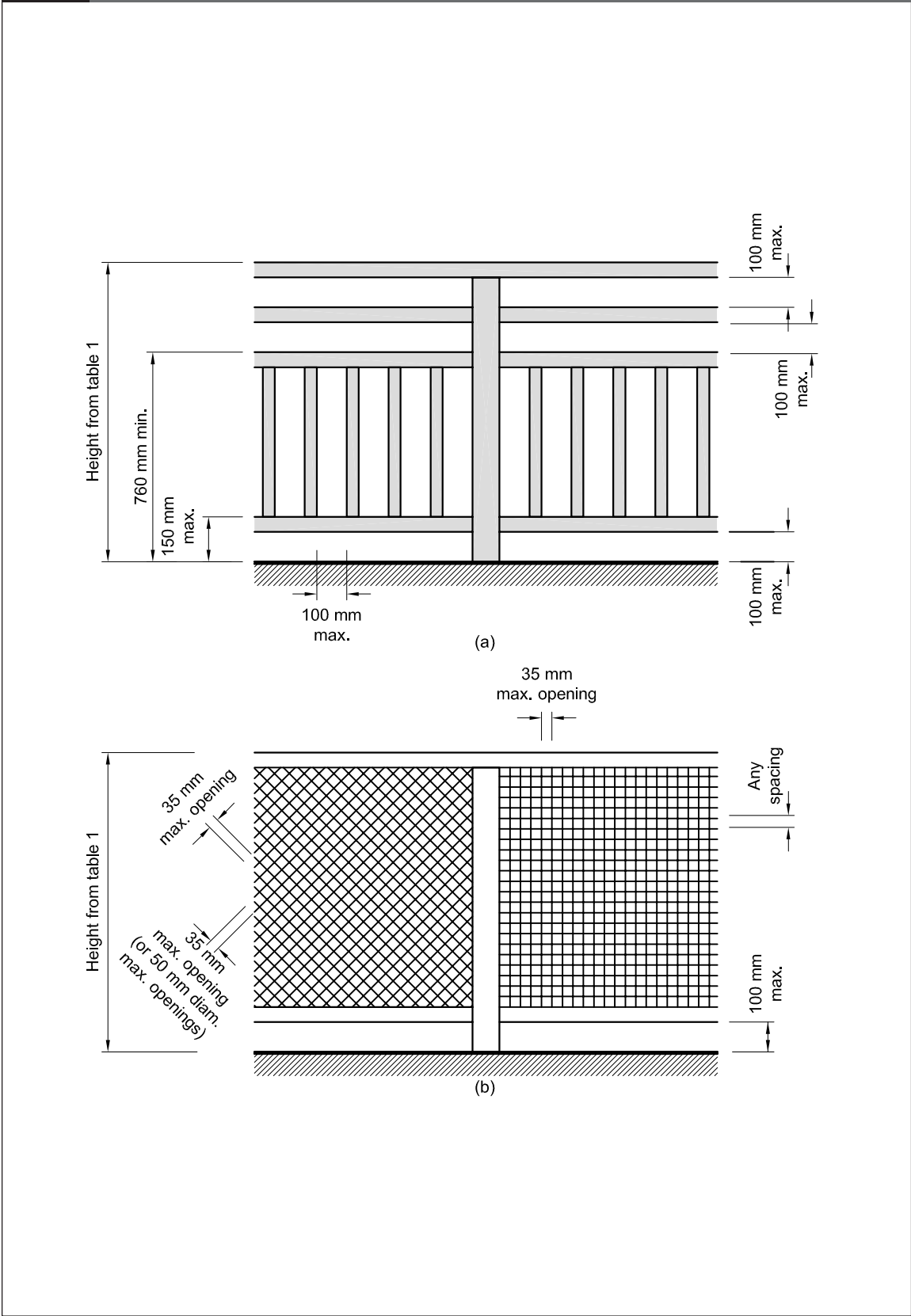


Figure 2: Barriers in areas likely to be frequented by children under 6 years of age – parallel members
Paragraph 1.2.1 a)

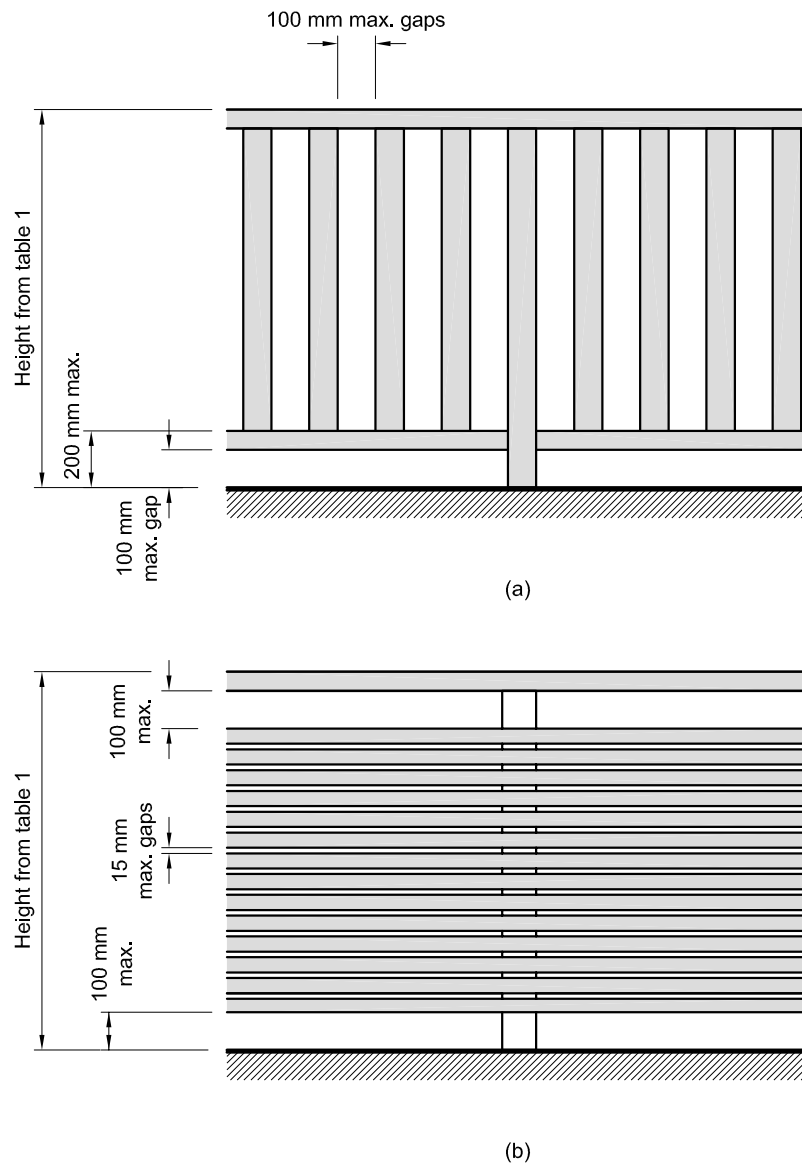


Figure 3: Barriers in areas likely to be frequented by children under 6 years of age – glass or other solid material
Paragraph 1.2.1 a)

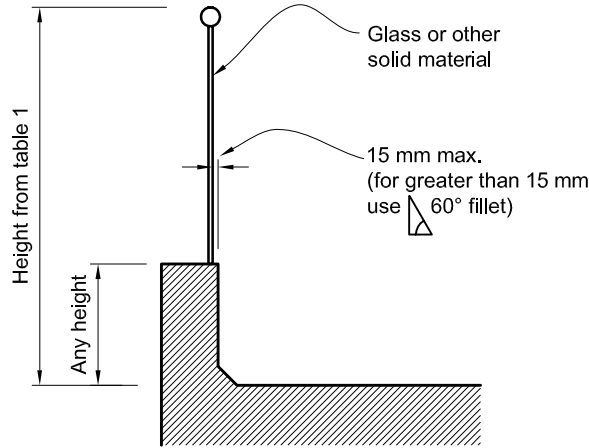
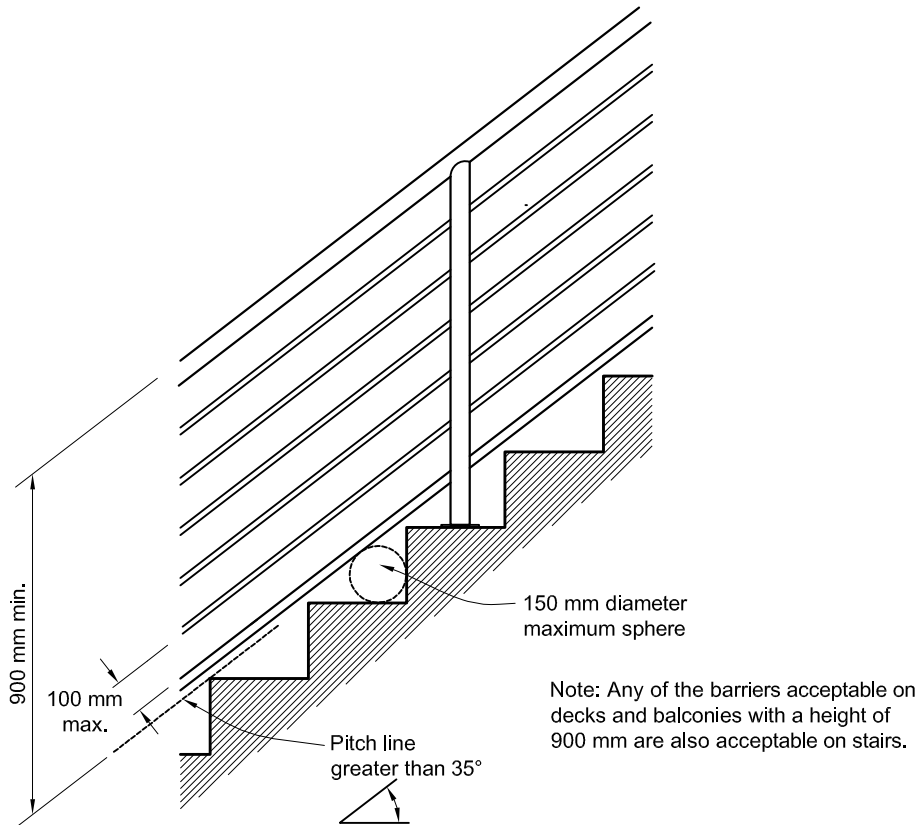


Figure 4: Stair barrier in an area likely to be frequented by children under 6 years of age
Paragraph 1.2.1 a)



1.2.2 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 *balustrade* members, or
- b) 460 mm vertically between longitudinal rails.

1.2.3 Barriers in *buildings* other than housing having a parapet or horizontal rail form of construction shall have the dimensions given in Figure 5.

1.2.4 Where the height of fall from the deck on a house is less than 1 m, a fixed seat may be constructed on the deck as shown in Figure 6(a). Where the height of fall from the deck is more than 1 m, a fixed seat shall be constructed as in Figure 6(b).

1.2.5 When a barrier is provided on a retaining wall, it shall comply with Paragraphs 1.1 and 1.2.

COMMENT:

NZBC Clause F4.2 refers to the 'likelihood' of accidental fall. Not all retaining walls are in a location where people are likely to fall from them. Therefore, the need for a barrier (and the type of barrier) on a particular retaining wall can be judged in terms of the likelihood of people being present at the top of that wall (see Determination No. 99/012 on www.dbh.govt.nz)

1.2.6 Construction site barriers shall have:

- a) one or more intermediate horizontal rails in addition to the top rail and a maximum vertical opening between rails of 460 mm, or
- b) a top rail at a height of 1000 mm and a toeboard that extends at least 225 mm above the platform, and
- c) barrier rails at a maximum distance of 200 mm horizontally from the platform edge.

Figure 5: Parapet and rail barriers
Paragraph 1.2.3

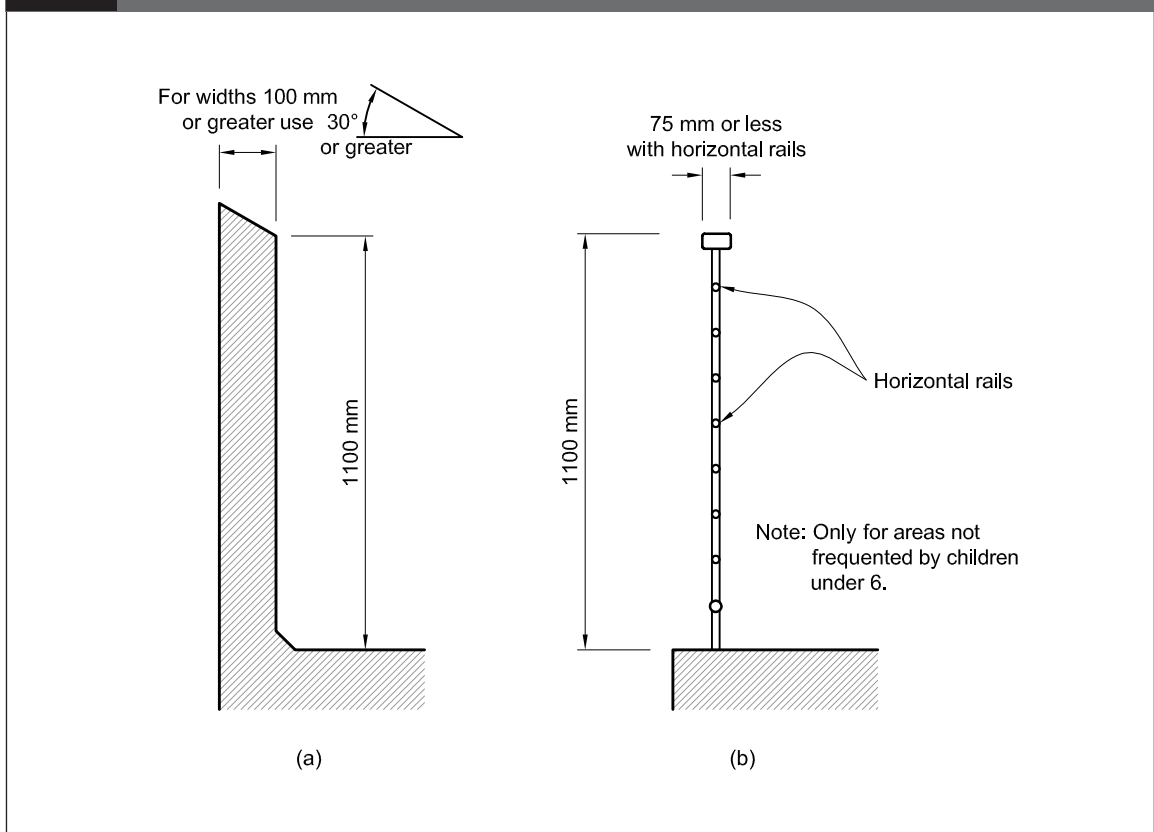
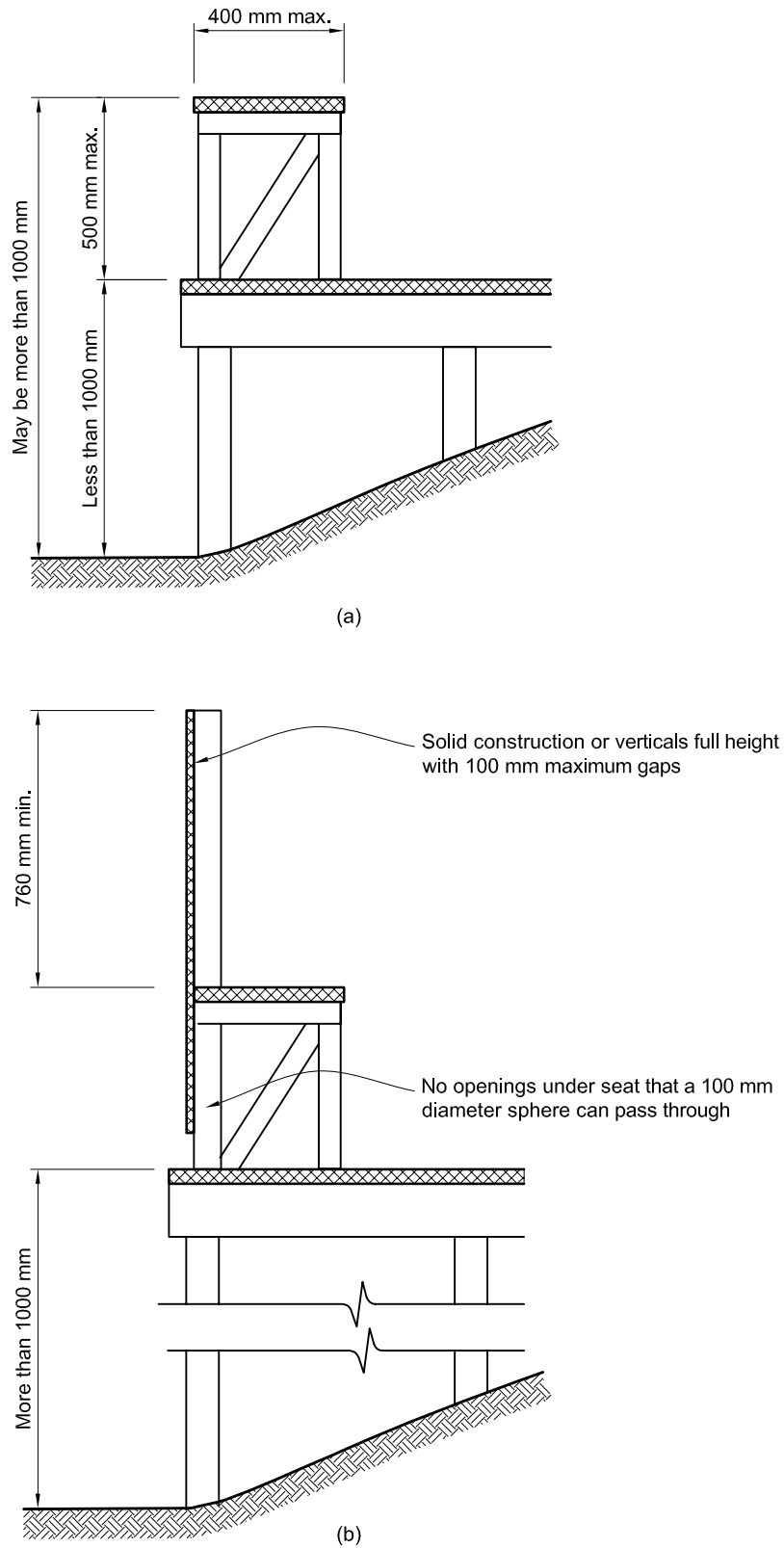


Figure 6: Fixed seat on a deck to housing
Paragraph 3.0



Scaffolding cross-bracing between standards with a single lift may be used as a top rail for construction site barriers 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.

1.2.7 The Schedule to the Fencing of Swimming Pools Act 1987 is a means of establishing compliance with NZBC Clause F4.

2.0 Opening windows

2.1 Paragraphs 2.1.1 to 2.1.4 apply where the possible height of fall from an open window is more than 1000 mm. The height of fall shall be measured from the inside floor level adjacent to the window. If a fixed window seat is provided, the sill height shall be measured from the seat.

2.1.1 In housing and areas of other *buildings* likely to be frequented by children under 6 years of age, a window with an opening width of less than 1000 mm shall have either:

- a) the lower edge of the opening at least 760 mm above floor level, or
- b) a restrictor fitted to limit the maximum opening so that a 100 mm diameter sphere cannot pass through it, or
- c) a 760 mm high barrier protecting the opening of solid construction or with vertical members its full height.

2.1.2 In housing and areas of other *buildings* likely to be frequented by children under 6 years of age, a window with an opening width of more than 1000 mm shall have either:

- a) the lower edge of the opening at a height above floor level as given for barriers in Table 1, or
- b) a barrier of the same height protecting the opening complying with Paragraph 1.2.1.

2.1.3 In areas of *buildings* not likely to be frequented by children under 6 years of age, a window with an opening width of less than 1000 mm shall have either:

- a) the lower edge of the opening at a height of at least 760 mm above floor level, or
- b) a restrictor fitted to limit the maximum dimension of the opening to 460 mm.

2.1.4 In areas of *buildings* not likely to be frequented by children under 6 years of age, a window with an opening width of more than 1000 mm shall have either:

- a) the lower edge of the opening at a height of at least 1100 mm above floor level, or
- b) a 1100 mm high barrier protecting the opening complying with Paragraph 1.2.2.

Index F4/VM1 & AS1

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

Barriers **AS1** 1.0
 construction **AS1** 1.2, Figures 1-4
 heights **AS1** 1.1, Table 1
 parapet and rail barriers **AS1** 1.2.3, Figure 5
 scaffolding **AS1** 1.2.6
 stair barriers **AS1** Figure 4

Children **AS1** 1.2.1, Figures 1-4

Construction site barriers **AS1** 1.2.6

Low-risk areas **AS1** 1.2.2

Opening windows **AS1** 2.0

Retaining walls **AS1** 1.2.5

Seats on decks **AS1** 1.2.4, Figure 6

