



Determination 2019/063

Regarding the compliance of a paved path and retaining wall without a barrier with Clause F4 Safety from falling at 44 Hart Road, Richmond



Summary

This determination considers the compliance of a paved path and retaining wall without a barrier with Building Code Clause F4 Safety from falling. The determination discusses the measurement of the height of the fall.

1. The matter to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004 (“the Act”) made under due authorisation by me, Katie Gordon, Manager Determinations, Ministry of Business, Innovation and Employment (“the Ministry”), for and on behalf of the Chief Executive of the Ministry.¹
- 1.2 The parties to the determination are:
- the owners of the property, J and P MacIntyre (“the owners”)
 - Tasman District Council (“the authority”), carrying out its duties as a territorial authority or building consent authority, which applied for the determination.
- 1.3 This determination arises from a dispute about safety from falling from a paved path on top of and adjacent to the edge of a retaining wall and upstand, which forms two sides of an out-of-ground residential swimming pool (“the retaining wall”).
- 1.4 The matter to be determined² is therefore whether the paved path and retaining wall as constructed in March 2019, without a barrier, complies with Clause F4 Safety from falling of the Building Code³. The retaining wall includes a masonry retaining wall with upstand, the paved surface covering the area atop the retaining wall (“the

¹ The Building Act and Building Code are available at www.legislation.govt.nz. The Building Code is contained in Schedule 1 of the Building Regulations 1992. Information about the Building Act and Building Code is available at www.building.govt.nz, as well as past determinations, compliance documents and guidance issued by the Ministry.

² Under section 177(1)(a) of the Act

³ First Schedule, Building Regulations 1992

path”), which is beside the pool and the lower paved and grassed areas at the bottom of the retaining wall (“the lower level”).

1.5 Matters outside this determination

- 1.5.1 Since receiving the application for determination, the owners advised the authority that a compliant barrier would be provided at the top of the retaining wall. On 12 September 2019, subsequent to the application for determination, the authority issued a code compliance certificate for the building consent No.170494, which included the construction of a safety barrier along the top of the retaining wall. (I have not seen any details of the safety barrier or code compliance certificate).
- 1.5.2 Although the situation is no longer in dispute, the authority chose to proceed with this determination in order to clarify the situation in regard to the compliance of the retaining wall (and the paved path which forms part of the access and use of the associated swimming pool) with Building Code Clause F4 Safety from falling.
- 1.5.3 In its submissions, the authority also mentioned concerns about the safety from falling in regard to various retaining walls other than the subject retaining wall which surrounds the pool. These retaining walls do not form part of the matter to be determined and therefore I leave that to the parties to resolve.
- 1.5.4 The design of the swimming pool and fencing with respect to the requirement to restrict the access of young children to the pool and immediate pool area (Building Code Clause F9 Means of restricting access to residential pools), is not in dispute and is therefore also not considered in this determination.
- 1.5.5 In making my decision, I have considered the submissions of the authority and other evidence in this matter. The relevant provisions of the Act, the Building Code and Acceptable Solution discussed in this determination is appended as follows:
- Appendix A: The Building Act 2004⁴
 - Appendix B: The Building Code
 - Appendix C: Acceptable Solution

2. The building work and background

- 2.1 The four-bedroom house is situated on a large east-sloping site, which has been excavated to provide level platforms for the house and the pool area. As shown in Figure 1, concrete block retaining walls border the west side of the house platform (“Level 1”) together with a timber retaining wall providing the pool area platform (“Level 2”) which is about 1.0m above Level 1.

⁴ In this determination, unless otherwise stated, references to sections are to sections of the Act and references to clauses are to clauses of the Building Code.

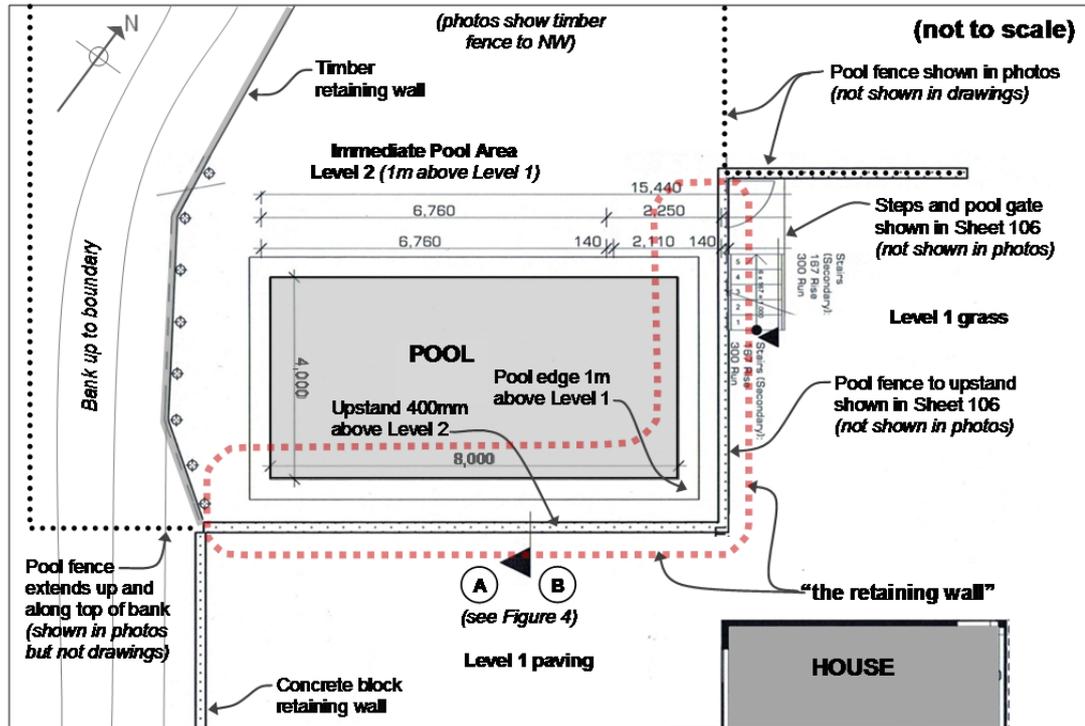


Figure 1: Approximate site plan

2.2 The immediate pool area is fenced to the south west, north west and part of the north east, with the remaining area bordered by the path and retaining wall considered in this determination. The site photographs provided by the authority show that the fence and stairs to the north east side of the pool (shown in Sheet 106 Ground floor plan) have not been constructed. Two of the authority’s photographs (March 2019) are shown in Figures 2 and 3.

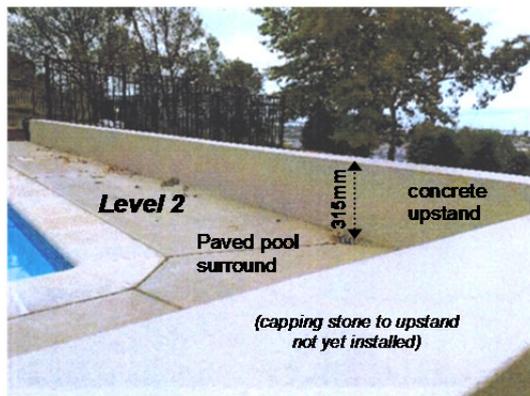


Figure 2: Pool surround and upstand (from the inside)

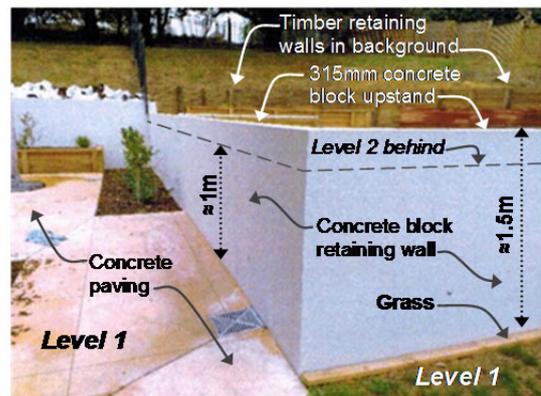


Figure 3: East corner of pool wall (from the outside)

2.3 The path and retaining wall

2.3.1 Details of the retaining wall in the consent drawings are shown in Figure 4, with the authority’s onsite measurements shown in brackets. As shown, a number of aspects and dimensions appear to conflict between the architectural details and the engineering details.

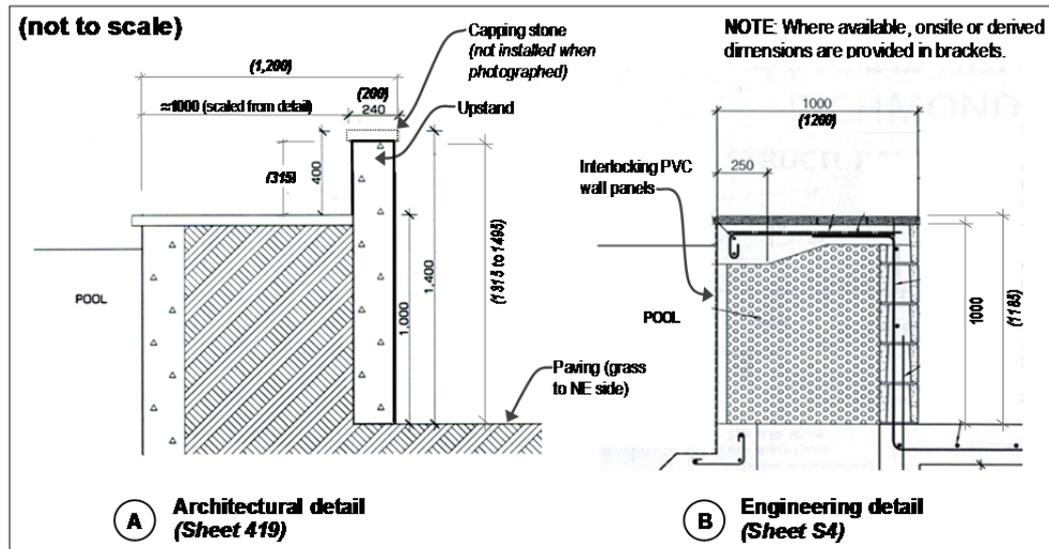


Figure 4: The retaining wall

2.3.2 Because the engineer's inspections included timber and concrete retaining walls and all aspects of the swimming pool (see paragraph 2.4.4), I have taken the engineering details to generally represent the as-built structure of the retaining wall – with the upstand added as two concrete block courses to the top of the retaining wall to reflect the architect's requirement.

2.4 The consent documentation and construction

2.4.1 On 2 May 2017 the owners applied for a building consent for a new 'two storey dwelling with internal access garage'. The application identified the means of compliance with the Building Code, which included the Acceptable Solution F4/AS1 for Clause F4 Safety from falling, with no alternative solution noted.

2.4.2 The application documentation included the following plans and specifications:

- architectural plan set
- architectural specification
- structural engineers plans and details (for various aspects including the design of the retaining wall).

2.4.3 Following a series of requests for information, which were responded to, the authority issued a building consent on 21 July 2017 (No.170494) for construction of the house and pool (I have not seen a copy of the building consent).

2.4.4 It appears that the authority and the engineer carried out various inspections during construction and an application for a code compliance certificate was received by the authority on 22 February 2019. The authority's record of the final inspection on 11 March 2019 identified a number of items requiring attention including:

Please ensure... that the potential fall from the pool paving is less than 1m...

Ensure all falls 1m or greater have compliant barriers...

2.5 The application for determination

2.5.1 The authority applied for a determination on 11 April 2019, but on 12 April 2019, the owners advised the authority that:

...we are in the process of arranging a suitable barrier around the pool. I can see how the [current] construction does not fit with the building code and there is no need to proceed with the determination...

2.5.2 In an email to the Ministry dated 16 April 2019, the authority confirmed that:

...even though the Owners don't wish to proceed with the determination, [authority] is keen to do so. Principally on the matter of where and how to measure the vertical distance to determine a fall of $\geq 1\text{m}$?

2.5.3 In correspondence with the Ministry, the authority made various additional comments about the situation, which I have included below as part of its submissions to this determination.

3. The submissions

3.1 The authority's submission

3.1.1 In its original and subsequent submissions, the authority set out the background to the dispute and included the following comments (in summary):

- The building consent application noted F4/AS1 as the means of compliance with Clause F4 of the Building Code.
- The architectural drawings indicate the location of the pool, but do not provide 'the exact dimensional setting out' in relation to the house or retaining wall.
- The architectural cross section of the retaining wall conflicts with the engineering detail in a number of aspects, including levels and dimensions.
- Notwithstanding differences between the architectural and engineering details and as-built dimensions, the lack of a barrier to the top of the retaining wall and upstand presents a risk of falling.
- Other retaining walls also extend more than 1000mm above paving level, with no barrier to protect against falling.

3.1.2 In regard to the retaining wall as constructed, the authority noted (in summary):

- The top of the finished upstand to the retaining wall will be about 1500mm above the adjacent ground or paving level.
- The objective of Clause F4 is to safeguard people from injury caused by falling, with the functional requirement that building work must reduce the likelihood of accidental fall.
- Performance requirements call for barriers to be provided where people could fall 1.0m or more and specify attributes for those barriers.
- A barrier guarding a level change must restrict the passage of young children in areas likely to be frequented by them, such as around a residential pool.
- The upstand provided to the retaining wall is able to be readily used by pool users (including young children) as a step or a seat. There is also a risk of slipping and tripping over the upstand to fall some 1500mm (including the capping).
- The adjacent lower level is a combination of grass, concrete paving slabs and planted garden borders.

- Although dimensions of the as-built retaining wall appear to comply with F4/AS1 'Figure 6(a) 'Fixed seat on a deck to housing'', this situation is different in that:
 - the retaining wall is a concrete retaining wall associated with a pool
 - the upstand to the retaining wall was not intended to be a fixed seat
- determining where to measure fall height from the retaining wall upstand is not analogous to how sill heights of opening windows are measured from adjacent internal floor or fixed seat levels because:
 - the retaining wall as installed is simply a large open area, whereas windows have different characteristics and can be fixed with restrictors
 - for a fixed seat beside windows, sill height is measured from that seat
 - sills cannot be readily sat on or stood on, whereas the upstand of the retaining wall is readily accessible to sit or stand on next to a drop of about 1500mm
- fall height at this retaining wall should therefore be measured from the top of the upstand, which is as agreed by other authorities in the South Island.

3.1.3 In regard to the retaining wall, the authority stated that it:

...believes a barrier is required to be constructed on top of a retaining wall that forms part of a surround to a raised swimming pool, associated with a detached residential dwelling, to safeguard people from injury caused by falling (NZBC Clause F4.1), and reduce the likelihood of accidental fall (NZBC Clause F4.2)

3.1.4 The authority requested a determination:

...as to whether the current situation (without the provision of a safety barrier) complies with the requirements of NZBC Clauses F4.3.1 and F4.3.4....

3.1.5 The authority provided copies of relevant records, including:

- the application for building consent
- some of the architectural consent drawings
- some of the structural engineer consent drawings
- the 'Producer Statement – PS1 – Inspection Schedule' dated 26 April 2017
- photographs of the retaining wall and some other site retaining walls.

3.1.6 As outlined in paragraph 2.5.1, after the authority applied for a determination the owners agreed to install 'a suitable barrier' and saw 'no need to proceed with the determination'. The owners therefore made no submission and provided no additional information pertinent to this determination.

3.2 Draft determination

3.2.1 A draft determination was issued to the parties for comment on 16 October 2019.

3.2.2 The authority responded on 18 October 2019 accepting the draft determination subject to non-contentious comments: I have incorporated amendments accordingly.

3.2.3 The owners responded on 18 October 2019 advising they accepted the determination and did not wish to make a submission.

4. Discussion

- 4.1.1 The authority has requested a determination ‘as to whether the current situation (without the provision of a safety barrier) complies with the requirements of NZBC Clauses F4.3.1 and F4.3.4’. Accordingly, I must decide whether the retaining wall as constructed in March 2019 complies with Clause F4 of the Building Code.
- 4.1.2 The authority has made numerous references to the proximity of the pool to the top of the retaining wall. I do not consider this to be the salient factor in this matter: whether or not there is a pool present, the matter at hand concerns the retaining wall and its compliance with Building Code Clause F4, the objective of which is to safeguard people from injury by reducing the likelihood of accidental fall.
- 4.1.3 As discussed in paragraph 1.5.1, the situation is no longer in dispute as the owners have advised the authority that a compliant barrier to the retaining wall has been installed. I understand that the building consent has been amended accordingly, and the authority has subsequently issued a code compliance certificate for the amended building consent No.170494, which included the construction of a barrier along the top of the retaining wall.

4.2 The requirements of Clause F4

- 4.2.1 The objective and functional requirements of Clause F4 are provided in Clause F4.1 and F4.2 respectively, which state:
- F4.1** The objective of this provision is to safeguard people from injury caused by falling.
- F4.2** *Buildings* shall be constructed to reduce the likelihood of accidental fall.
- 4.2.2 The objective and functional requirement of Clause F4 is reflected in the first purpose⁵ of the Act which is to ensure that ‘people who use buildings can do so safely and without endangering their health’ (see Appendix A1.1).
- 4.2.3 In this case the relevant performance requirement of Clause F4 is Clause F4.3.1, which states:
- F4.3.1** Where people could fall 1 metre or more from an opening in the external envelope or floor of a building, or from a sudden change of level within or associated with a building, a barrier shall be provided.
- 4.2.4 Performance requirement Clause F4.3.4 relates to barriers and states:
- 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 adequate rigidity,
 - (d) Be of adequate 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
 - (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.
 - (h) Be constructed so that they are not readily able to be used as seats.
- 4.2.5 In the absence of a barrier, I am unable to consider compliance with Clause F4.3.4 as the authority has requested (refer paragraph 4.1.1), and therefore limit this discussion

⁵ Section 3 of the Act

to whether the original design satisfied the relevant performance requirement being Clause F4.3.1.

4.3 Compliance of the retaining wall with Clause F4

- 4.3.1 In considering the compliance with Clause F4.3.1 I must consider whether a fall of 1.0m or more could occur.
- 4.3.2 In paragraph 2.3.1 I referred to Figure 4 and noted a conflict in the design of the retaining wall between the architectural drawings and the engineer drawings, and as I have not seen a copy of the building consent it is not clear to me what proposal was granted with the building consent. Irrespective of the difference of design, both drawings show the vertical distance between the paved path and the lower level to be at least 1.0m, and in the case of the upstand (including capping) a 1.4m vertical distance between the top of the upstand of the retaining wall and the lower level. The authority's photos and onsite dimensions confirm this to be the case. I am satisfied in this case there is a fall distance of 1.0m or more.
- 4.3.3 Previous determinations⁶ have considered the 'likelihood of accidental fall' in considering whether someone could fall. 'Likelihood' is not defined in the Building Act or the Building Code, however the word 'likely' has been considered by the District Court⁷ as 'a reasonable probability, or that having regard to the circumstances of the case it could well happen'.
- 4.3.4 I consider there is a reasonable probability that a person could fall from the retaining wall in this case given the way in which the paved path and retaining wall upstand will be used. For example, it is in my view is it reasonably probable that the path and upstand could be used; as a means of accessing various parts of the pool area, for recreational activities in association with the use of the pool (which could be boisterous in nature), and in respect of the retaining wall upstand (which is some 200mm wide) this is easily able to be walked along or sat upon. I also consider the close proximity of the pool and likelihood of splashed water being present being factors which will contribute to the probability of a person to slipping and accidentally falling from the retaining wall.
- 4.3.5 It is therefore clear to me that in this case there is a fall of 1.0m or more from a sudden change in level arising from the presence of the retaining wall, and there is a reasonable probability that a person could fall from the retaining wall. Therefore Clause F4.3.1 requires a barrier⁸ to be constructed to the top of the retaining wall. Accordingly, as the retaining wall (at March 2019) was constructed without a barrier complying with Clause F4.3.4, the retaining wall does not comply with Clause F4 Safety from falling.

4.4 Where the fall height is measured from

- 4.4.1 Despite paragraph 4.3.5 above, the authority has sought clarification on whether the height of fall, in this case, is the vertical dimension measured from the path to the lower level, or the vertical dimension measured from the top of the retaining wall upstand to the lower level.
- 4.4.2 The authority has submitted the Acceptable Solution F4/AS1 ("the Acceptable Solution"), at paragraph 1.2.4 (in respect of fixed seating to decks) and paragraph 2.0

⁶ Determination 2018/002 Regarding the decision to issue a notice to fix for a retaining wall (13 February 2018)

⁷ *Rotorua District Council v Rua Developments Limited* DC Rotorua NP1327/97, 17 December 1999.

⁸ A barrier that complies with Clause F4.3.4

(in respect of falling from an open window less than 1000mm wide) requires clarification regarding measuring the height of fall. Therefore the authority is of the view that neither of these aspects in the Acceptable Solution applied in the current case and accordingly neither should be used as a means of measuring the vertical distance of the height of fall for the retaining wall.

- 4.4.3 The point from which the height of fall is measured will depend on the particular circumstances, taking into account the objective and functional and performance requirements of Clause F4, which is safeguarding people from injury and reducing the likelihood of accidental fall.
- 4.4.4 In other words, I consider the Building Code provides for the height of fall to be measured, with respect to the particular circumstances of a situation, as the distance from the point where there is a likelihood of accidental fall to the point where considerable injury from falling will occur. Previous determinations (refer paragraph 4.3.3) have considered the likelihood or reasonable probability of a person accidentally falling, and Clause F4.3.1 recognises that falls from 1.0m or more are likely to result in considerable injury.

5. The decision

- 5.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the retaining wall (as constructed in March 2019) without a barrier complying with Clause F4.3.4 does not comply with Clause F4 of the Building Code with respect to safety from falling.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 13 December 2019.

Katie Gordon
Manager Determinations

Appendix A: The Building Act 2004

A.1 Relevant provisions of the Building Act 2004

A1.1 The purpose and principles of the Act are provided in section 3:

3 Purposes

This Act has the following purposes:

- (a) to provide for the regulation of building work, the establishment of a licensing regime for building practitioners, and the setting of performance standards for buildings to ensure that—
 - (i) people who use buildings can do so safely and without endangering their health; and
 - (ii) buildings have attributes that contribute appropriately to the health, physical independence, and well-being of the people who use them...

Appendix B: The Building Code

B.1 The relevant requirements of the Building Code

B1.1 The relevant parts of Clause F4 include:

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 building, or from a sudden change of level within or associated with a building, a barrier shall be provided.

Limits on application

Performance F4.3.1 shall not apply where such a barrier would be incompatible with the intended use of an area... or to buildings providing pedestrian access in remote locations where the route served presents similar natural hazards.

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 adequate rigidity,
- (d) Be of adequate 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
- (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.
- (h) Be constructed so that they are not readily able to be used as seats.

Limits on application

Performance F4.3.4(h) does not apply to Housing.

Appendix C: Acceptable Solution

C.1 The relevant parts of F4/AS1

C1.1 Parts of F4/AS1 relevant to the retaining wall are:

1.1 Barrier heights

1.1.1 Minimum barrier heights are given in Table 1.

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 intermediate 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 <i>pitch line</i> or stair <i>nosings</i> .		
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, <i>theatres</i> , and stadiums.		
5. Where a <i>handrail</i> is mounted on top of a stairway barrier it may transition up to a height of 1100 mm on the intermediate landings.		

1.2 Barrier construction

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...

C1.2 Parts of F4/AS1 possibly analogous to the retaining wall are:

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 possible height of fall shall be measured from the inside floor level adjacent to the window. Paragraphs 2.1.1(a) and 2.1.2(a) apply only when there are no projections or ledges below the opening that would assist a child in climbing.

COMMENT:

The height of the lower edge of the window opening above the floor usually determines the safety of the window for small children. However, the presence of a window seat or toilet pan means children can more easily gain access to the window opening.

If a fixed window seat is provided, the lower edge of the opening shall be measured from the seat.

Where a toilet pan or any other fixed feature is within 500 mm horizontally of a window, the lower edge of the opening shall be measured vertically from the pan or feature.

.....

COMMENT:

When a window opening width is less than 1000 mm a sill height of 760 mm is considered sufficient to protect older children and adults from falling through the opening. When the opening is wider than 1000 mm the opening needs to be treated in the same way if it were a balcony and the Table 1 barrier heights used, as in paragraph 2.1.2

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.

Amend 2
Jan 2017

