

Safety barriers in an apartment building

1 THE MATTER TO BE DETERMINED

- 1.1 The matter before the Authority is whether safety barriers in front of wall openings in an apartment building comply with clause F4 of the building code.
- 1.2 In making its determination the Authority has not considered whether the safety barriers comply with any other provisions of the building code.

2 THE PARTIES

- 2.1 The applicant was the territorial authority. The other party was the owner.

3 THE BUILDING

- 3.1 The building is an 8 storey apartment building. Interim code compliance certificates were issued for some of the apartments as they were completed. However, doubts arose about whether the safety barriers complied with the building code. The territorial authority refused to issue further certificates until those doubts had been resolved, and applied for this determination for that purpose.
- 3.2 The windows concerned have sliding sashes with sills 450 mm above floor level. The safety barriers consist of a horizontal rail at sill level and another 750 mm above that (1200 mm above floor level), with 10 mm vertical baluster rods at 100 mm centres between the rails.
- 3.3 The drawing on the following page was prepared by the owner's architects for this determination and compares the safety barriers installed with a similar barrier complying with Approved Document F4/AS1.

4 THE BUILDING CODE AND F4/AS1

4.1 The relevant provisions of the building code (the First Schedule to the Building Regulations) are:

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
- (f) In the case of a swimming pool, restrict the access of children under 6 years of age to the pool or 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.

4.2 The relevant provisions of the acceptable solution F4/S1 are:

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 [100 mm in this case], 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.

5 THE SUBMISSIONS

5.1 The applicant made no specific submissions, merely identifying the safety barriers as the matter of doubt.

5.2 The owner's submissions, through a firm of architects, are shown on the drawing on the preceding page.

- 5.3 When the doubt first arose, a member of the Authority's staff stated that in his view the barrier could be accepted as complying with clause F4 of the building code. That statement was subject to the usual disclaimer to the effect that it was his personal opinion on the information provided and that the Authority might take a different view if the matter was submitted to it for determination.
- 5.4 When the application for a determination was received, the Authority obtained a report from an independent architect having special experience with safety barriers. That report was copied to the parties, who did not wish to comment on it.
- 5.5 In his report, the independent architect approached the matter on the basis that "the design and construction details may be evaluated under F4/AS1 paragraph 4.0". On that basis he noted that:
- 1 The schematic cross section drawing . . . shows a sliding window sash. The sill is set at 460 AFFL [ie. 460 mm above the finished floor level] on a nib wall.
 - 2 The design and construction details may be evaluated under F4/AS1 Section 4.0.
 - 3 The combined nib wall and pipe window safety rail (safety barrier) are 1200 AFFL which complies with Clause 4.0 1(c).
 - 5 The top of the window rail (safety barrier), or lower edge of the opening, is 740 above any toeholds, less the window frame sill which may be up to 60 thick. Net safety barrier rail of 680 exceeds Clause 4.0.2(a) requirement of 610 above toehold.
 - 7 The barrier is not located in front of the window as required by Clause 4.0.1(c). I presume that this requirement applies to casement or top hung sashes to enable window sashes to open, it is not relevant to a sliding sash window. The barrier is effective when in front of or behind the sliding sash.
 - 8 The opening does have a combined nib wall and safety barrier with a toehold at 460 AFFL which exceeds the requirement of Clause 4.0.2(c). A narrow interpretation of the design details may focus on the 740 effective barrier height above the nib wall as not complying with the 760 high requirement. However, I consider that the combined wall opening barrier of 1200 high to be the effective safety barrier.
 - 9 The overall barrier height of 1200 exceeds the minimum requirement in table 1 of Clause 1.1.1.
 - 10 In my opinion the design complies with the Objective of Clause F4 which is to safeguard people from injury cause by falling.

6 DISCUSSION

- 6.1 The safety barrier is proposed as an alternative solution, an innovative approach to complying with the building code. The question is whether it does in fact comply with the building code.
- 6.2 There are various methods by which an alternative solution may be evaluated for compliance. The independent architect chose to evaluate the safety barrier by comparison with the acceptable solution F4/AS1. That method has been specifically approved by the High Court, which said¹:
- The acceptable solution is not an exclusive one [and may be used as] a guideline or a benchmark. To that extent, any deviation from it must achieve the same objectives, but whether it does or not is a question of fact.
- 6.3 The Authority has carefully considered the independent architect's detailed evaluation of the safety barrier and is satisfied that it amounts to reasonable grounds for being satisfied that the safety barrier complies with clause F4 of the building code.
- 6.4 The Authority is very conscious that one of the important reforms introduced by the Building Act was the opportunities for innovation created by the change to the performance-based building code specifying what a building is to achieve instead of the previous prescriptive regulations specifying detailed design and construction requirements. It is therefore pleased to see this example of an innovative design for a safety barrier complying with the building code.

7 THE AUTHORITY'S DECISION

- 7.1 In accordance with section 20(a) of the Building Act the Authority hereby determines that the safety barriers as installed comply with clause F4 of the building code.

Signed for and on behalf of the Building Industry Authority on this 16th day of March 1999

W A Porteous
Chief Executive

¹ *Auckland City Council v New Zealand Fire Service* [1996] 1 NZLR 330.