

Determination 2009/8

The code-compliance of a proposed pergola as a barrier for a house located at 190 Huntsbury Avenue, Christchurch

1 The matter to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004¹ (“the Act”) made under due authorisation by me, John Gardiner, Manager Determinations, Department of Building and Housing (“the Department”), for and on behalf of the Chief Executive of the Department. The applicant is the owner, Mr M Buchanan (“the applicant”). The other party is the Christchurch City Council (“the authority”) carrying out its duties and functions as a territorial authority or building consent authority.
- 1.2 I take the view that the matter for determination, in terms of section 177(a)² of the Act, is whether the combination of a proposed low upstand wall and a pergola to be attached to a house complies with Building Code³ Clause F4 Safety from falling (Schedule 1, Building Regulations 1992).
- 1.3 In making my decision, I have considered the submissions of the parties and the other evidence in this matter.

2 The building work

- 2.1 The building work that is the subject of this determination is a proposed cantilevered pergola that is approximately 6.5 metres wide x 1.3 metres long (“the pergola”) that is to be constructed at one elevation of a house. The pergola consists of a galvanised steel frame and inclined timber slats spaced at 100mm centres and bolted to the frame members. The slats are set at an angle and have tapered top edges. The section through the pergola is shown in Figure 1.

¹ The Building Act 2004 is available from the Department’s website at www.dbh.govt.nz.

² 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.

³ The Building Code is available from the Department’s website at www.dbh.govt.nz.

- 2.2 The pergola is situated 630mm below the sill of a window that has sliding opening sashes and which is fixed to an upstand wall that has an internal height above the first floor of the building of 430mm. The window provides a maximum opening of 4.5m, the sill itself is 270mm deep.

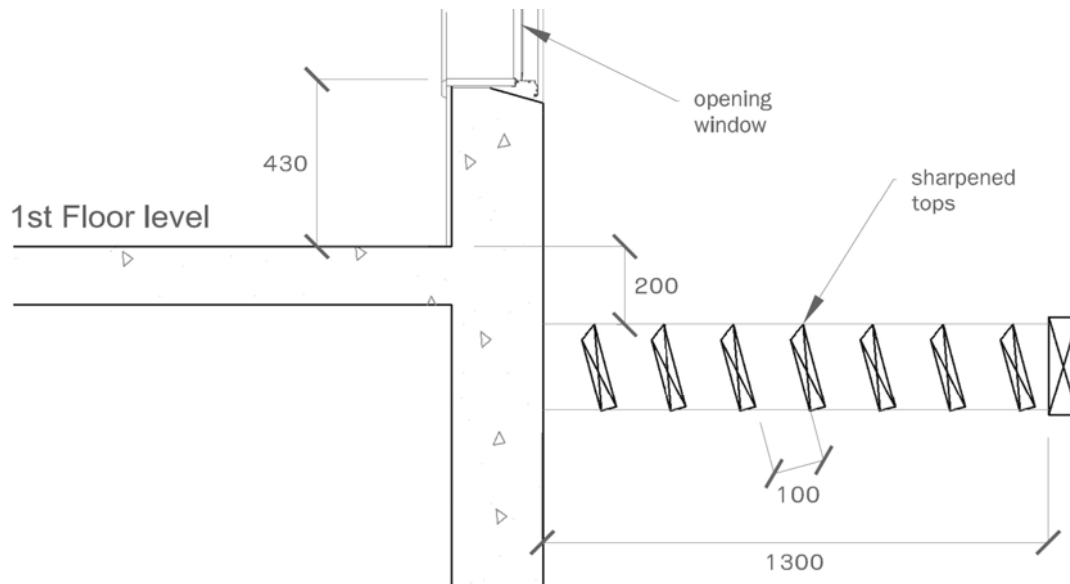


Figure 1 Detail showing the proposed pergola section

3. Background

- 3.1 The house in question is currently under construction. The applicant sought an acceptance in principle from the authority based on a proposed design that showed a wall upstand 500mm high and a pergola formed from flat-topped timber slats.
- 3.2 In an email to the applicant dated 7 July 2008, the authority stated that it was unable to accept the proposal. The authority noted that there were similarities when compared to a pergola that was constructed of tensioned wires, and which had been subject to a determination (2001/2). However, the authority noted that it would be easier for children to walk along the proposed timber slats than on tensioned wires. The pergola design needed to be at least equal to, or better than, the tensioned-wired pergola design. In addition, the authority's preference was for a window upstand higher than the one proposed.
- 3.3 Following advice from an officer of the Department, the applicant amended the pergola design to that shown in Figure 1.
- 3.4 The application for a determination was received by the Department on 14 November 2008.

4. The submissions

- 4.1 In a covering note to the application, the applicant described the pergola and its location. The applicant noted that the purpose of the pergola was to protect people from falling from a first floor window with opening sashes.

- 4.2 The applicants forwarded copies of:
- two partial elevations
 - the original and revised sketch sections through the pergola
 - the correspondence with the authority and the Department
 - Determination 2001/2.
- 4.3 The authority did not forward a submission in response to the application for a determination.
- 4.4 The draft determination was sent to the parties for comment on 22 January 2009. Both parties accepted the draft without comment.

5 The legislation and the compliance documents

- 5.1 Relevant provisions of the Act are:

17 All building work must comply with building code

All building work must comply with the building code to the extent required by this Act, whether or not a building consent is required in respect of that building work.

- 5.2 Relevant provisions of the Building Code are:

CLAUSE F4—SAFETY FROM FALLING

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 in level within or associated with a building, a barrier shall be provided.

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.

- 5.3 The relevant provisions of the acceptable solution F4/AS1 are:

1.1.1 Acceptable minimum barrier heights are given in Table 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:

- Heights are measured vertically from floor level (ignoring floor coverings) on floors, landings and ramps, and from *pitch line* or stair *nosings* on stairways.
- 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.

5.4 In regards to window openings in spaces frequented by children F4/AS1 says:

4.0 Opening Windows

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:

- The lower edge of the opening located no less than 760 mm above floor level and 610 mm above any toeholds, or
- 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
- 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.

6. Discussion

6.1 In Determination 2001/2, the Building Industry Authority (the predecessor to the Department) considered a horizontal canopy made up from tensioned wires (“the canopy”) and a barrier that has some characteristics similar to the current situation.

6.2 However, Determination 2001/2 was in respect of a roof deck to which access by small children could be controlled. Most of the roof deck was protected by barriers in excess of 1000 mm high complying with the Compliance Document F4/AS1. The deck, in combination with the canopy, was therefore accepted as complying with Clause F4 of the Building Code.

6.3 This determination considers an opening of 4.5m wide to a living space in a house which children under six are likely to frequent, whether under adult supervision or not.

The upstand as a barrier

- 6.4 By itself the upstand is not of an appropriate height for a barrier and does not comply with Clause F4. It is accepted that the upstand falls well sort of the barrier height described in Paragraph 2.0 of F4/AS1.
- 6.5 The upstand is of a height that provides easy access for children under six to climb over, and in my opinion is of a depth that would also allow a child to walk or run along its length. In my opinion the upstand does not comply with the requirement to restrict the passage of children under six.

The pergola

- 6.6 In an effort to achieve compliance the applicants have proposed a horizontal barrier outside the upstand in the form of a pergola. I note the following:
- As for the canopy in Determination 2001/2, the height of fall onto the pergola from the sill is less than 1 metre.
 - As for the canopy in Determination 2001/2, the change of level from the pergola to the ground is at the outer edge of the pergola.
 - The pergola is located along the full length of the upstand.
 - The pergola is 1300 mm wide, compared with the 1500 mm canopy width. In Determination 2008/81, I considered that a landing area 1200 mm wide would provide adequate protection in the case of a fall off a deck. Accordingly, I consider a 1300 mm width to be adequate in this situation.
 - The proposed pergola has gaps less than 100mm between the timber slats, and the slats have sharpened top edges that would make them difficult, but not impossible, for anyone to walk across.
- 6.7 Determination 2001/2 noted:
- 7.2.2 Clause F4 requires a safety barrier where people “could fall 1 metre or more from . . . a sudden change of level”. In this case, the change of level is at the outer edge of the canopy, not at the edge of the deck. The real question is whether people are likely to be near the outer edge of the canopy. In that respect . . . [it is] important that the canopy would be difficult to walk across.
- 6.8 The Building Code recognises differences in physical size and behaviour between adults and children under six years of age. Accordingly, I consider that the effectiveness of the pergola as a barrier from falling will be different for adults than it will be for children under six years of age.
- 6.9 An adult who fell onto the pergola is able to return to a position of safety by climbing back over the upstand. The behaviour of children, particularly those under six, may not be as rational as that of an adult in seeking a position of safety, which requires a child to negotiate a height of 630mm and a sill depth of 270mm. In my opinion easy access onto the pergola from the low upstand would put a child in a hazardous position.

7 How can compliance be achieved?

- 7.1 While the Act does not require me to provide a code compliant solution to the parties, in this instance I believe guidance about how compliance might be achieved would be useful.
- 7.2 With the proposed pergola in place, which in my view provides a code compliant solution for adults, a barrier 760mm high, as described in Paragraph 4.0.2(c) of F4/AS1 located in front of the window opening, will provide a code compliant solution for children under the age of six.
- 7.3 Alternatively, and in the absence of the pergola, a barrier fitted to full width of the window of a height described in Table 1 of F4/AS1 would comply with Clause F4.

8 The decision

- 8.1 In accordance with section 188 of the Act I hereby determine that the proposed combination of the upstand and pergola does not provided a design solution that complies with Clause F4 of the Building Code.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 25 February 2009.

John Gardiner
Manager Determinations