

Determination 2006/117

Balcony drainage for a multi-level apartment building at 5 O'Reily Avenue, Wellington

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, Determinations Manager, Department of Building and Housing (“the Department”), for and on behalf of the Chief Executive of that Department. The applicant is the owner, Boulcott Village Properties Ltd acting through a management company (“the applicant”), and the other party is the Wellington City Council (“the territorial authority”).
- 1.2 The matter for determination is whether the use of “spillover” stormwater discharge (uniform discharge) from the balconies on the building, Levels 2 to 8 inclusive, complies with the Building Code (First Schedule, Building Regulations 1992).
- 1.3 In making my decision, I have considered the submissions of the parties, the report of the independent expert commissioned by the Department to advise on this dispute (“the expert”), and the other evidence in this matter.
- 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.

2 The building work

- 2.1 The building work has been planned and built in two stages. Stage Two consists of seven floors (Levels 2 to 8) (currently partially completed) constructed on the existing Stage One two-storey building (Levels G and 1). The matter in dispute is about the stormwater discharge from the balconies to the Stage Two work, being the balconies from Levels 2 to 8 inclusive.
- 2.2 Levels 2 to 8 each contains three apartments, being 24 apartments in total. It is proposed to construct a cantilevered balcony to each of the 24 apartments constructed on the north elevation of the building. Each balcony will extend to the boundary of the property. The overall size of each balcony is 3480mm x 1025mm (3.567m²) on plan. The balconies are timber-framed and are supported on structural

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

steel frames. The decks to the proposed balconies consist of 19mm thick “Kwila” close boarding covered with a 1.5mm thick butyl-rubber membrane. Each balcony is to be protected by a balustrade formed from perforated aluminium panels. The stormwater drainage discharge from the decks is a “spill-over” system at the deck perimeters.

- 2.3 At Ground floor there is a continuous verandah canopy, at Level One there is a continuous balcony. Both features have a controlled stormwater disposal system consisting of gutters and downpipes.

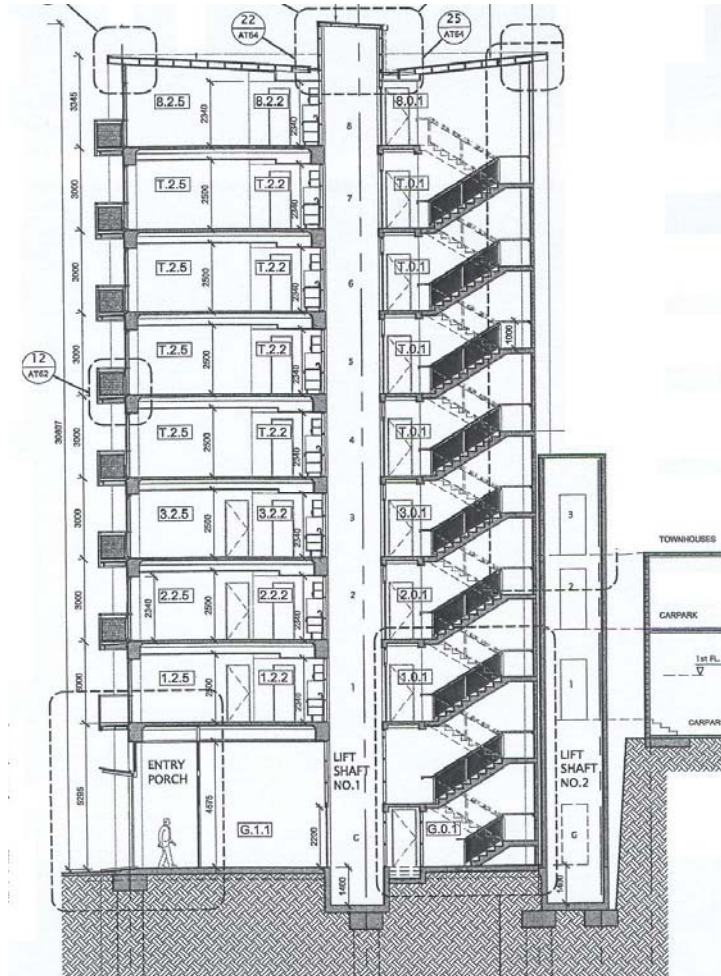


Figure 1: Section through the building.

3 Sequence of events

- 3.1 Prior to the issuing of a building consent, various e-mails passed between the applicant’s architect (“the architect”) and the territorial authority from 26 October 2005 to 21 November 2005. These basically discussed the stormwater drainage of the balconies if they were to be of a solid surface construction. In particular, the correspondence from the architect noted that:

- other multi-level projects consented to by the territorial authority had not required controlled disposal systems for solid floor balconies similar to the ones in question
- the applicant was of the opinion that the principles of Approved Document E2/AS1 of the Building Code could not apply to the building unless that document's scope was amended
- the balconies did not have an enclosed deck in terms of E2/AS1
- the applicant considered aspects of Determination 2003/4 supported its arguments.

3.2 The territorial authority's position as set out in the correspondence can be summarised as saying:

- perforated decks do not require drainage
- decks with a membrane or roof cladding have to comply with section 17 of the Act and the relevant clauses of E1 and E2. This would require the installation of a controlled stormwater disposal system at each balcony.

3.3 In the final e-mail of 21 November 2005, the applicant stated that the deck design would be changed from a solid surface to a perforated metal surface.

3.4 Subsequent to this amendment, the territorial authority issued a building consent on 29 March 2006, and work then commenced on the project.

3.5 The applicant requested a determination as to whether the use of "spill-over" decks on the property would comply with the Building Code. The determination application was received by the Department on 9 August 2006.

3.6 At present all the units are under a single ownership, but they are likely to be sold under separate titles once the building is completed.

4 The submissions

4.1 In a lengthy submission to the Department dated 31 July 2006, the architect set out the background to the dispute. He also noted that other projects already approved by the territorial authority had "spillover" decks. The applicant had assessed the proposed amended balconies in terms of the Act, clauses E1 and E2 of the Building Code and Determination 2003/4. The conclusions reached by the architect were that:

- the catchment area of each deck is slightly over 3m². The cumulative affect of water cascading down a set of seven balconies would only be nominal as
 - the total volume of surface water would not increase because of the balconies
 - the continuous gutter and associated downpipes at Level 1 would absorb the effect on people at street level of any rainwater cascading off the balconies
 - it is unlikely that occupants of the building will be out on their balconies if it is raining
 - there would be no adverse effects to any adjoining property.

- as it is unlikely that adjoining property will be affected, the requirements of clause E1 will not be breached
- as the balconies do not have enclosed balustrades, the principles of paragraph 7.4 of E2/AS1 do not apply
- the building in question is outside the scope of paragraph 1.2 of E2/VM1 (I note here that the submission erroneously refers to E2/AS1 in this respect)
- the findings set out in Determination 2003/4, particularly paragraphs 5.2 and 6, support the applicant's position.

4.2 The applicant also forwarded copies of:

- the correspondence between the parties
- photographs of various Wellington high-rise buildings with "spill-over" balcony decks
- relevant legislative documents.

4.3 In a letter to the Department dated 7 September 2006, the territorial authority also set out some of the background to the dispute. The territorial authority also said:

- if the serviced apartments were to be sold off as separate titles, the question of loss of amenity to the lower balconies would have to be considered. The use of "spillover" balcony decks would constitute such an amenity loss
- it considered that the principles of clauses E1.2 and E1.3.1 applied and consideration needs to be given to paragraphs 8.5.6 and 8.5.10 of E2/AS1
- stormwater from solid-surface decks must be controlled without causing nuisance or damage to other property. This can be achieved either by the use of spoutings at the deck edges or an internal gutter that would discharge into downpipes connected to the stormwater system.

4.4 I then prepared a draft determination, which was forwarded to the parties on 9 November 2006. The applicant notified the Department on 13 November 2006 that the draft determination was accepted.

4.5 The territorial authority responded in a letter dated 17 November 2006, stating that for various reasons it did not accept the draft. The territorial authority's main area of concern was the effect that any discharge of water from the balcony decks would have on the adjacent public spaces.

5 The expert's report

5.1 The expert reviewed the issues relating to the surface water discharge from the balconies and furnished a report that was dated 6 October 2006. The expert stated that, in order to judge the degree of potential nuisance to the floors below a given balcony, it was necessary to calculate the quantity of surface water likely to collect on the balcony. The expert considered that the approach adopted in Determination 2003/4 to calculate surface discharge from the face of a building was "overly conservative". The expert was of the opinion that the research undertaken by CSIRO and described in its publication NSB 177A was more relevant to the current situation.

5.2 The main points raised by the expert in the context of the CSIRO research can be summarised as follows:

- The distribution of wind and wind-driven rain is concentrated at the upper floors and at the edges of buildings and is quite low in the centre and lower stories of buildings.
- During wind gusts in storm conditions, surface water accumulates on the face of buildings within a time-span of less than a minute to a point where it is torn off and is re-distributed along, around or over the building. As rain strikes a building in waves, wind deflection gives rise to periods during which the face of a building is free from rain.
- It is appropriate to calculate and take into account the likely volume of water expected to discharge over a balcony when considering how such water might behave when intercepted by a balcony and whether the combined flow might cause a nuisance to the floors below.
- Conservatively, on a multi-storey building the catchment area would span up to 2 storeys and ignoring whether a balcony would interrupt the water flow, the flow should be calculated on this area. In the Wellington area this would equate to approximately 0.12 l/s in a 10% AEP (annual event probability) event.
- The rain collected on the 3.5m² horizontal top surface of the top balcony would be no more than 0.07 l/s in a 10% AEP event. It is incorrect to cumulatively add the flow from the upper balconies as rain either falls on an upper balcony or is blown onto the face of the building within any 2 storey catchment area.
- Based on these calculations, the estimated flow rate of discharge from one of the higher balconies would be 0.19 l/s in a 10% AEP event.

5.3 The expert's conclusions can be summarised as:

- The 0.19 l/s run-off calculation equates to the discharge from a roof with an area approximating 7m².
- As the face of the balcony is 3.4m long, the discharge flow over its face approximately 0.06 l/s in a 10% AEP event, which might be noticeable and can be compared to the 0.02 l/s in a 10% AEP event of the surrounding rainfall falling on a 1m² horizontal area.
- It is not considered that the 0.04 l/s increase in moisture in the air would be a nuisance in the context of the amounts of wind and rain required to produce such an increase.
- In the event of lesser events, the flow from a single balcony would reduce to as little as 0.02 l/s per metre of balcony face.

5.4 The expert stated that if the conclusion reached was too optimistic, the potential nuisance could be mitigated by sloping the deck of the balconies towards the face of the building. This would ensure that the water flow would run down the sides of building until it was re-distributed by the wind.

- 5.5 Copies of the report were forwarded to the parties. In an e-mail to the Department on 25 October 2006, the architect noted that the report concluded that the water discharge would be insignificant and therefore justified the design.
- 5.6 The territorial authority also replied by e-mail on 26 October 2006, stating that it still believed that the control of the stormwater was an issue. It also considered that any free-falling water would do so over the boundary and possibly cause damage to the adjoining territorial authority legal road.

6 The legislation

- 6.1 The relevant performance of the building code is:

Performance

E1.3.1 Except as otherwise required under the Resource Management Act 1991 for the protection of other property, surface water resulting from a event having a 10% probability of occurring annually and which is collected or concentrated by buildings or siteworks, shall be disposed of in such a way that avoids the likelihood of damage or nuisance to other property.

7 Discussion

- 7.1 As noted in paragraph 3.6, the apartments are likely to be sold under separate titles. If this is not the case, then the question of “other property” does not arise with regard to the individual units. However, assuming that the building will eventually be unit-titled, I have considered that each unit will be “other property” in relation to the other units in terms of clause E1.3.1. The territorial authority also has concerns about damage to its legal road, which I also accept is “other property”. Although the Compliance Document E2/AS1 describes appropriate guttering details if required, I do not believe that clause E2 is relevant in this case.
- 7.2 Before addressing the effect that projecting balconies on high-rise buildings have on wind-driven rain, I note that blank external walls of high-rise buildings without such balconies will also concentrate water and discharge it onto other properties. However, as this situation has not been raised in this determination, I am not required to decide on this issue.
- 7.3 Reference has also been made by the parties to Determination 2003/4, which in effect decided that balconies on multi-storey buildings concentrated surface water and discharged it onto the balconies below (“other property”), with cumulative effects for lower balconies. However, this determination did not address the necessary issue of how to calculate the resultant flow from the 10% AEP nor whether the calculated flow would cause “damage or nuisance to other properties”. In addition, I do not accept that Determination 2003/4 endorsed the CSIRO statement that “balconies with areas less than 10m² do not require their water runoff to be calculated as this can be considered nominal only”.
- 7.4 Neither of the parties has provided calculations relating to the balcony discharge flow resulting from a 10% AEP event. The expert has provided such calculations in line with the CSIRO publication NSB 177A, and has concluded that the increase in moisture in the air caused by the balconies in a 10% AEP event would not constitute a nuisance to the owners of lower-level balconies. In the absence of any conflicting

evidence from the parties, I accept this opinion. In addition, I note there is a full-length cantilevered deck with a controlled stormwater disposal system at a level below all the balconies. Accordingly, I consider that the effect on the territorial authority's legal road of free-falling water resulting from a 10% AEP event would be negligible, and as such, not constitute a nuisance in terms of clause E1.3.1.

- 7.5 I consider that the basic concern raised in the territorial authority's response to the draft determination was in regard to the effect the balcony water discharge had on the adjoining property. I note that the expert has calculated that the discharge from the balconies in a 10% AEP event is quite negligible. If there is no wind then any rain would only fall on the top balconies. I am of the opinion that, even if the balconies were not there, in a 10% AEP event the strength of the wind would be such as to drive rain outside the boundaries of the building. Accordingly, I am not convinced that the balconies exacerbate this scenario.
- 7.6 The territorial authority is prepared to accept that if the balconies have perforated decks they would not require controlled stormwater drainage. I am of the opinion that in many instances, the solid deck balconies without controlled drainage would afford better protection to lower balcony users than would the perforated alternative.

8 The decision

- 8.1 In accordance with section 188 of the Act I determine that the proposed amended design of the "spillover" solid decked balconies complies with the provisions of E1 of the Building Code.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 1 December 2006.

John Gardiner
Determinations Manager