



Determination 2010/91

Refusal to issue a code compliance certificate for a 10-year-old block of shops and apartments at 310 Tinakori Road, Thorndon, 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, Manager Determinations, Department of Building and Housing (“the Department”), for and on behalf of the Chief Executive of that Department.

1.2 The parties are:

- Mr J Moore and Mr D Loo who are the owners of the building (“the applicants”) acting through their consulting engineer and agent (“the agent”)
- the Wellington City Council carrying out its duties as a territorial authority or building consent authority (“the authority”).

¹ The Building Act 2004, Building Code, compliance documents, past determinations and guidance documents issued by the Department are all available at www.dbh.govt.nz or by contacting the department on 0800 242 243.

1.3 This determination arises from the decision of the authority to refuse to issue a code compliance certificate for the applicants' 10-year-old building, which contains four shops and four apartments ("the building"), because it was not satisfied that the building complied with Clauses B2 Durability, E2 External Moisture and E3 Internal Moisture of the Building Code (First Schedule Building Regulations 1992).

1.4 The matter to be determined² is therefore whether the authority was correct to refuse to issue a code compliance certificate. In deciding this, I must consider:

1.4.1 Matter 1: The external envelope

Whether the external envelope of the building complies with Clause E2 External Moisture and Clause B2 Durability (insofar as it relates to Clause E2) of the Building Code. The external envelope includes the cladding, its configuration and components, junctions with other building elements, formed openings and penetrations, and the proximity of those building elements to the ground.

1.4.2 Matter 2: The remaining Building Code matters

Whether the ventilation of the sub-floor area complied with Building Code Clause E2 External moisture, and whether the toilet ventilation complied with Building Code Clause G4 Ventilation.

1.4.3 Matter 3: The durability considerations

Whether the elements that make up the building work comply with Clause B2 Durability of the Building Code, taking into account the age of the building work.

1.5 Matters outside this determination

1.5.1 The authority has submitted that given the age of the building work, this determination should look at the building's compliance with all of the clauses of the Building Code. However, the authority issued interim code compliance certificates for the work and undertook a final inspection (refer paragraphs 3.3 and 3.4). The final inspection noted three items as outstanding.

1.5.2 The determination is therefore confined to the outstanding items plus external envelope (which is partly covered by one of the items). The determination does not consider the remaining clauses of the Building Code.

1.6 In making my decision, I have considered the submissions of the parties, the report of the expert commissioned by the Department to advise on this dispute ("the expert"), and the other evidence in this matter.

2. The building work

2.1 The building is a three-storey apartment block situated on a gently sloping site with a steep embankment rising at its rear. Although the site is located in an area that can be exposed to very high winds, it is relatively sheltered, as it is protected by the large

² Under section 177(b)(i) of the Act (prior to 7 July 2010). In this determination, unless stated otherwise, references to sections are to sections of the Act and references to clauses are to clauses of the Building Code.

embankment behind it and is also protected geographically from the worst of the wind. The wind zone is considered high to very high.

- 2.2 The building is not complex being rectangular in plan. Four retail shops occupy the ground level, with four two-storied apartments above them. Construction is conventional light timber frame, with a mixture of concrete block retaining and foundation walls, monolithic cladding, wooden framed windows and profiled metal roofing. The floors are concrete at ground floor level, and timber for the levels above.
- 2.3 Laboratory analysis of a sample of the framing taken from a rear storage shed indicated that the timber was untreated. Given the date of construction and the lack of other evidence, I consider that all of the wall framing is not treated to a level that will resist decay.
- 2.4 The monolithic cladding consists of a painted and textured direct-fixed 40mm EIFS³. On both the front and the rear of the building the cladding was applied over ply lining. The cladding makes extensive use of polystyrene details around its windows, doors and parapets. These feature details consisted of 40mm thick polystyrene attachments fixed on top of the cladding, making those areas of the exterior cladding 80mm thick.
- 2.5 The joinery has been installed with alloy head, sill and jamb flashings.
- 2.6 The roof is a simple hipped design, clad with long-run corrugated iron. It is surrounded on three sides by a parapet. The parapet is timber-framed, clad with EIFS and weatherproofed with LAM, and has a near-flat top. There are decorative polystyrene details attached to it.
- 2.7 **The decks**
- 2.7.1 The four apartments have decks at their front and rear, with apartment one at the south end of the building also having a side deck. The front decks create the verandas for the shops below.
- 2.7.2 All of the decks are constructed from ply weatherproofed with LAM. The front decks are divided by timber framed walls that have flat tops in parts, and are bordered by timber balustrades. The balustrades are weatherproofed along with the deck with the LAM applied part way up the base of the timber posts.
- 2.7.3 The rear decks run between the apartments and the concrete block retaining wall at the back of the site. Apartments one and two and three and four are separated by storage sheds and two and three by flat-topped timber framed wall. There is a LAM-coated gutter, which runs between the deck and the retaining wall.
- 2.7.4 The rear decks roof the corridor below which provides ventilation and access to services behind the building. The walls of the corridor are concrete block and form the retaining wall for the embankment and the rear wall for the ground floor shops and supporting foundation.

³ Exterior insulation and finishing system

3. Background

- 3.1 The authority issued a building consent (number 48167) for the building on 7 April 1999, under the Building Act 1991.
- 3.2 The foundations, retaining walls, floor slab, bracing and fire protection services were all inspected by the engineers who issued PS4 producer statements for the work. The remaining inspections were carried out by the authority, with the first inspection (of the pre-slab drainage) completed on 8 June 1999.
- 3.3 The authority issued interim code compliance certificates for the apartments as they were finished, with the first certificate for apartments 2 and 3 issued on 13 October 2000, the certificate for apartment 1 issued on 27 October 2000, and the certificate for apartment 4 issued on 5 December 2000. The authority also issued a compliance schedule for the building's various systems on 15 December 2000.
- 3.4 On 30 July 2003, the applicants contacted the authority about obtaining a code compliance certificate. A final inspection was carried out on 14 October 2003 and three items identified that required remediation, namely (with the corresponding Code Clause in brackets):
- subfloor ventilation was required in behind the lower floor service area (E2)
 - toilet ventilation needed to vent to atmosphere (G4)
 - the ground clearance of the cladding system was non-compliant (E2).

The inspection record also noted that a final plumbing inspection was yet to be carried out. This was completed and passed on 29 March 2004.

- 3.5 It appears that the applicants took no further steps to obtain a code compliance certificate for their building until April 2010. On 11 April 2010, the agent contacted the authority requesting a meeting to discuss what would now need to be done to obtain a certificate.
- 3.6 On 22 April 2010 the authority sent a letter to the agent about the request for a code compliance certificate. The letter stated that in this case, because of the length of time that had elapsed since the majority of building work was completed in 2010; the authority was not willing to issue a code compliance certificate for the work. And stated:

This is not an indication that your building is failing or deficient, but simply that too long a period has elapsed since it was built.

- 3.7 The Department received an application for a determination on 28 May 2010.

4. The submissions

- 4.1 The agent's submission outlined the background to the situation, explaining that the authority had carried out and approved all the relevant site inspections for the building as well as issuing the interim code compliance certificates for the individual apartments. The agent pointed out that the final inspection raised some 'very minor items that were addressed at this time'. The agent stated that the authority had

advised that they were 'unable' to modify the B2 Durability date to the date of the final inspection or another such appropriate time.

4.2 The applicants provided copies of:

- the project information memorandum and building consent
- plans and specifications for the original building consent
- correspondence between the parties
- the various inspection records and site inspection checklists
- the independent certification and PS4 producer statements
- the interim code compliance certificates for the four apartments
- the compliance schedule for the building dated 15 December 2000.

4.3 The authority made a submission dated 15 June 2010. The authority stated that it 'could not be satisfied that the work would comply with the requirements of the New Zealand Building Code.'

4.4 The authority also submitted that in its opinion the Determination should be on all Code Clauses with particular focus on B2 and E2 (refer to paragraph 1.5).

4.5 With its submission, the authority provided copies of:

- structural specifications and calculations for the original building consent
- the fire safety design report for the building
- the application for a project information memorandum and building consent dated 18 November 1998
- third party correspondence about the building's fire alarm system
- an inspection diary for inspections from 8 June 1999 to 31 May 2000
- plans for the original building consent.

4.6 A draft determination was provided to the parties for comment on 8 September 2010. The authority accepted the draft without comment. The agent accepted the draft on behalf of the applicant subject to comment. I have amended the determination as I believe appropriate.

4.7 In response to the draft the agent noted that the toilet vents had been approved by the authority's inspector and attached a copy of an inspection record dated 29 March 2004 which notes 'final inspection approved'. The agent also queried how sub-floor ventilation is related to Clause E2.

4.8 In response to the agents queries, the 'sub-floor' referred to in this determination includes both the space under the building and the corridor servicing the back of the ground floor shops as the spaces are effectively one in the same in terms of ventilation. I also refer the agent to Clause E2.3.4 which states 'Building elements susceptible to damage must be protected from the adverse effects of moisture entering the space below suspended floors.'

5. The expert's report

5.1 General

- 5.1.1 As mentioned in paragraph 1.6, I engaged an independent expert to provide an assessment of the condition of those building elements subject to the determination. The expert is a member of the New Zealand Institute of Building Surveyors. The expert inspected the building on 7 and 8 July 2010 and provided a report on 20 July 2010. A copy of the report was provided to the parties on 20 July 2010.
- 5.1.2 The expert noted that the building was built according to the plans except for the roof parapets, which were finished with LAM instead of cap flashings.
- 5.1.3 The expert observed that, in general, the building had been constructed to a satisfactory standard, with the cladding well-finished and all flashings well-installed and effective, although the cladding was now in need of repainting. The interior of the retail shops and apartments had also all been finished to a high standard with no noticeable failures.

5.2 Moisture levels

- 5.2.1 The expert carried out invasive and non-invasive moisture testing at various locations around the outside of the building. Elevated readings were returned from:

Non-invasive readings

- 40% to 99% in places on the deck beside apartment 1 (and that in general exceeded 20%) on the side and rear decks

Invasive readings

- 22% and 23% at ground floor level cladding at the corners of shop 1 and shop 4 respectively
- 24% at junctions between the front deck dividing walls and the building face
- 25% and 68% at the deck dividing walls for apartment 2 and 3 respectively.

I note that Moisture levels above 18% generally indicate that external moisture is entering the structure and further investigation is required. Moisture readings over 40% indicate that the timber is saturated and decay will be inevitable over time.

- 5.2.2 In addition to the elevated readings, the expert noted the difficulty of detecting moisture behind the surface of cladding because of the way the cladding had been applied over the ply lining. In addition, the feature details where the cladding was up to 80mm thick made it 'extremely difficult to identify with confidence' where moisture had entered the external cladding, except for in very wet areas. However, both the polystyrene detailing and the plywood lining represented risk factors. In some instances, although moisture levels in the cladding were at the lower end, they confirmed that there had been moisture entry.

5.3 Weathertightness observations

5.3.1 Commenting on the weathertightness detailing, the expert noted the following.

Cladding

- Though most of the cladding to the shops is well-protected from the weather, the cladding on shops 1 and 4 is exposed to the weather on the sides and front corners.
- The cladding on the corner of apartment 1 was cracked where the balustrade was fixed hard up against a polystyrene cladding detail. There is also considerable cracking below the veranda at this junction 'with indications of moisture-stressed cladding failure'.
- There was a small crack in the cladding on the corner of shop 4, with a partially exposed junction between the veranda and the cladding above it, and testing confirmed that there had been moisture entry.
- The vertical polystyrene strips attached at window sills and window head details had flat top junctions with the cladding, without flashings or 'opportunity for water deflection or drainage', and hence relied on the integrity of the texture coating and joint to remain waterproof. Around some of these details there is moss, mildew, cracked cladding and texture failure, which all indicate possible moisture ingress.
- The deck dividing walls and parapet walls all have flat or near-flat tops. None of the walls have cap flashings, relying instead on the LAM, and regular maintenance, to remain waterproof.
- Wrinkles in the LAM on the top of the parapet walls indicate that the membrane has moved, possibly due to moisture penetration and/or building movement.
- A number of deck dividing walls to cladding junctions do not have saddle flashings, and some of these junctions have cracking and evidence of previous repair.
- The deck to cladding detail on the corner of apartment 4 is exposed and cracked, suggesting moisture ingress and resulting damage.

Cladding clearances

- Cladding on the front and side of the ground-floor shops extends down to or below the footpath and the tiled side entry areas (on shops 1 and 4).
- The cladding on the boundary dividing wall and the walls of the storage sheds on the rear decks extends hard to the concrete block retaining wall. In addition, the framing for these structures has been fixed to the top of the concrete block wall, creating a risk of moisture leaks at the junction.
- The cladding on the rear deck dividing wall between apartments 3 and 4 has been taken hard to the sheds' roof surface, and there is evidence of cladding damage in these areas which has been repaired.

- Balustrade rails finish hard against the cladding in places, and in the southern corner of unit 5 the cladding surface has cracked and failed, possibly as a result of moisture entering the cladding at the junction with the balustrade.

Flashings

- The polystyrene sill detail envelopes the window sill flashings and this could enable moisture to seep into the detail and drain uncontrolled beneath.

Roof

- The roofing iron at the roof's western and northern rear corners is embedded, creating a risk of moisture wicking behind the surfaces. There is cracking in the cladding at this point, which has been repaired.

Decks

- The surface of the rear decks is leaking, with many of the decks having wrinkled and split LAM surfaces and elevated moisture readings.
- There is a leak from the drain outlet from the rear deck of apartments 1 and 2, and water is dripping from this into the service corridor below. A 'minor amount of advanced decay' is visible in the framing in this area.
- The deck balustrade posts are wrapped in LAM to stop water entering the deck substrate. One post has a delaminated joint at this point, allowing moisture entry, while others had variable raised moisture levels near the posts.

Rear retaining wall

- The concrete block retaining wall at the rear of the apartments is cracked and requires remedial attention to ensure water does not enter the wall below the LAM drain surface.

5.4 Sub-floor ventilation

- 5.4.1 The expert noted that the sub-floor ventilation had been installed at the rear of the shops and this work was now compliant.

Matter 1: the external envelope

6. Discussion

- 6.1 The evaluation of building work for compliance with the Building Code and the risk factors considered in regards to weathertightness have been described in numerous previous determinations (for example, Determination 2004/1).

6.2 Weathertightness risk

- 6.2.1 This building has the following environmental and design features that influence its weathertightness risk profile:

Increasing risk

- It is in a high to very high wind zone

- It is three storeys high
- It is without eaves but rather has parapets on three of its four sides
- There are lengthy internal gutters behind the parapets
- The rear decks are built over the service corridor
- There are enclosed decks over inhabited spaces

Decreasing risk

- Its plan and form is of medium to low complexity
- The veranda provides protection for the front of the ground-floor shops.

6.2.2 When evaluated using the E2/AS1 risk matrix, these features show that the building demonstrates a high weathertightness risk rating. I note that if the current details of E2/AS1 were adopted to show code compliance, a drained and ventilated cavity would be required. However, a drained cavity was not a requirement of E2/AS1 at the time of construction.

6.3 Weathertightness performance

6.3.1 It is clear from the expert's report that the cladding installed on the building is unsatisfactory in terms of its weathertightness because elevated moisture levels were recorded in the external wall and deck, and damage was observed to the cladding that is likely to have been caused by moisture ingress.

6.3.2 I accept the expert's assessment. When combined with other factors, including the inadequate ground clearances, cracking and cladding details that may allow moisture to enter the structure behind; they create more cause for concern.

6.3.3 Taking into account the expert's report and comments, as recorded in paragraph 5.3, I conclude that the following items require rectification with respect to weathertightness:

- the decking membranes
- the decking to balustrade junctions
- the balustrade to cladding junctions
- the decking to cladding junctions
- the parapet tops and the junctions between the parapet and the roof
- the clearance between the storeroom roof and the cladding
- the ground clearances for the cladding
- the drainage leak from the deck
- cracks in the cladding and in the tops of the polystyrene detail attached to the cladding
- the dividing walls on the front deck, in particular where they meet the walls of the building and the balustrade

- the dividing wall on the rear deck, along its full length and where it meets the wall of the building
- the rear block dividing wall, including cracks in its top and the junction between it and the storage sheds.

6.3.4 I note that the expert did not comment on the internal gutters behind the parapets to three sides of the building. In my view both elements require investigation with respect to adequate fall, and the adequacy of linings, outlets and overflows.

6.4 **Weathertightness conclusion**

6.4.1 I consider the expert's report establishes that the current performance of the cladding is not adequate because there is evidence of moisture penetration and retention. In particular, the cladding and deck demonstrate key defects (see paragraph 5.3.1) that are likely to have contributed to the current moisture penetration and put the building at risk of further water penetration in the future.

6.4.2 The expert's report also identified the presence of a range of known weathertightness risk factors in this building. The presence of the risk factors on their own is not necessarily a concern, but they have to be considered in combination with the faults identified in the cladding system. It is that combination of risk factors and faults that indicate that the structure does not have sufficient provisions that would compensate for the lack of a drained and ventilated cavity. Consequently, I am not satisfied that the cladding system, as installed, complies with Clause E2 of the Building Code.

6.4.3 In addition, the building work is also required to comply with the durability requirements of Clause B2. Because the cladding faults on the building may allow further ingress of moisture in the future, the building work does not comply with the durability requirements of Clause B2.

6.4.4 I consider that final decisions on whether code compliance can be achieved by either remediation or re-cladding can only be made after a more thorough investigation of the cladding to verify the extent of the damage. Given the age of the building, and therefore the time that the framing may have been exposed to moisture, I consider further investigation is necessary to determine the condition of the timber framing.

6.4.5 The investigation will require a careful analysis by an appropriately qualified expert. Once that decision is made, the chosen remedial option should be submitted to the authority for its comment and approval.

Matter 2: The remaining Building Code matters

7. Discussion

7.1 I accept the expert's assessment that adequate sub-floor ventilation has now been installed. I also accept that adequate ventilation has now been installed to the second floor toilets.

7.2 I do not accept that adequate ventilation has been provided to the ground floor toilets. The Acceptable Solution for Clause G4 Ventilation, G4/AS1, requires that mechanical extract ventilation to toilets to be exhausted to the outside. I do not

accept that the mechanical ventilation being exhausted to the enclosed space at the rear of the ground floor level meets this requirement.

Matter 3: The durability considerations

8. Discussion

- 8.1 The relevant provision of Clause B2 of the Building Code requires that building elements must, with only normal maintenance, continue to satisfy the performance requirements of the Building Code for certain periods (known as durability periods) ‘from the time of issue of the applicable code compliance certificate’ (Clause B2.3.1).
- 8.2 The applicants raised the possibility of obtaining a modification of this requirement in their submission and in earlier discussions with the authority.
- 8.3 In previous determinations (for example Determination 2006/85) I have taken the view that a modification of this requirement can be granted if I can be satisfied that the building complied with the durability requirements at a date earlier than the date of issue of the code compliance certificate, the date being one that is agreed between the parties.
- 8.4 However, in conjunction with this, I also need to consider the nature and extent of the defects, the length of time that they may have been evident, and their consequential impact on the building’s compliance with other Building Code clauses, particularly Clauses B1 and E2.
- 8.5 In this case, because of the potential extent of the defects to the external envelope of this building, I am not satisfied that a modification of the durability provision is appropriate at this stage. However the matter may be reconsidered by the authority once the weathertightness issues and all associated work have been addressed.

9. What is to be done now?

- 9.1 The authority should issue a notice to fix requiring the owners to bring the building into compliance with the Building Code. The notice should identify the defects listed in paragraph 6.3.3 and take into account paragraph 6.3.4 and 6.4.4, and refer to any further defects that might be discovered in the course of investigation and rectification. The notice to fix should not specify how the defects are to be remedied and the building brought into compliance with the Building Code as that is a matter for the applicant to propose and the authority to accept or reject.
- 9.2 In response to the notice to fix, the applicant should engage a suitably qualified person to undertake a thorough investigation of the external envelope to determine the extent of the defects and produce a detailed proposal describing how the defects are to be remedied. The proposal should be submitted to the authority for approval. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

10. The decision

- 10.1 In accordance with section 188 of the Building Act 2004, I determine that the building does not comply with Clauses B2 Durability, E2 External Moisture, and G4 Ventilation of the Building Code, and accordingly I confirm the authority's decision to refuse to issue a code compliance certificate.
- 10.2 I also confirm that the sub-floor ventilation complies with Building Code Clause E2 External Moisture, and the ventilation to the second floor toilets complies with Building Code Clause G4.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 27 September 2010.

John Gardiner
Manager Determinations