

## Determination 2010/024

### Refusal to issue a code compliance certificate for four 14-year-old townhouses at 23 Bishop Street, St Albans, Christchurch



#### 1. The matters to be determined

- 1.1 This is a determination under Part 3, Subpart 1 of the Building Act 2004<sup>1</sup> (“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 applicants are the owners of the four townhouses (“the applicants”), acting through Mr G McMahon who is one of the owners. The other party is the Christchurch City Council (“the authority”), carrying out its duties and functions as a territorial authority or a building consent authority.
- 1.2 This determination arose from the decision by the authority to refuse to issue a code compliance certificate for the townhouses because it was not satisfied that certain aspects of the building work complied with the Building Code (First Schedule, Building Regulations 1992).
- 1.3 The matter to be determined<sup>2</sup> is whether the decision of the authority to refuse to issue a code compliance certificate was correct. In making this decision, I must consider:

<sup>1</sup> 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](http://www.dbh.govt.nz) or by contacting the department on 0800 242 243.

<sup>2</sup> Under section 177(b)(i) of the Building Act 2004. 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.

### **1.3.1 Matter 1: the external envelope**

Whether the external envelope of the building complies with Clauses B2 “Durability” and E2 “External Moisture” 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 these building elements to the ground.

### **1.3.2 Matter 2: 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.

1.4 In making my decision, I have considered the applicant’s submission, the report of the independent expert (“the expert”) commissioned by the Department to advise on this dispute and the other evidence in this matter.

## **2. The building work**

2.1 The building work is a complex of four townhouse units on a level site, which is in a medium wind zone for the purposes of NZS 3604<sup>3</sup>. The townhouses have two storeys and are linked by their garages. They run east to west on their shared cross-lease section, with their living areas facing roughly north. Each townhouse has a small deck built over its living area.

2.2 The townhouses are founded on a concrete slab foundation and constructed with timber-framed walls. A solid plaster (stucco) external wall cladding system, with a low-density fibreboard rigid substrate, is direct fixed to the timber framing. The interior walls and ceilings of the townhouses are lined with plasterboard. The townhouses have pre-painted, long-run, corrugated steel roofs, and aluminium window joinery. While most of the doors and windows have metal head flashings, there are no sill or jamb flashings.

2.3 Testing indicates that the timber is likely to be untreated. Given this evidence and the date of construction, I consider that the external framing of the building is unlikely to be treated to a level that will provide any resistance to fungal decay.

## **3. The background**

3.1 The authority issued a building consent for the building work on 15 December 1993. The consent was issued to a building company, which was the owner at the time. The authority subsequently carried out various site inspections, and an interim code compliance certificate was issued for unit 1 on 25 July 1995. At some stage the units were sold by the building company. Units 1 and 3 are still lived in by the original purchasers. The owners of units 2 and 4 are the second owners.

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<sup>3</sup> New Zealand Standard NZS 3604: 1999 *Timber Framed Buildings*.

- 3.2 A LIM report issued by the authority in respect of unit 4, dated 25 January 1996, stated that a code compliance certificate was issued for the building work on 25 July 1995. However, it appears that the code compliance certificate referred to in the LIM report is the interim certificate issued for unit 1.
- 3.3 In July and August 1997, the authority contacted the applicants to arrange a time for a final inspection of the building work. Inspections were carried out during August and September and various matters noted that needed to be completed or rectified, including (on 18 September 1997) cracks to the plaster. According to the applicants, all of these matters were attended to. An interim code compliance certificate was issued for unit 3 on 16 July 1999.
- 3.4 In April 1999, the authority wrote once more to the owners of unit 4 seeking to arrange a time for a final inspection of their property. This inspection was carried out on 11 May 1999 and again it was noted that there was 'cracking to external cladding'.
- 3.5 In June 2009, a privately arranged pre-purchase inspection of unit 4 was carried out by a property inspection company. The inspection report noted that there had been minor cracking to the exterior cladding, but that this had been sealed and repainted. It also noted that the spouting extended into the cladding in some places and that this would need to be rectified 'to prevent moisture ingressing into the dwelling'. Other features of concern were the absence of sill and side flashings around the windows, and the lack of horizontal or vertical expansion and contraction control joints in the cladding. In 2009, the owners of unit 4 put their townhouse up for sale and at this time it emerged that there was no code compliance certificate for the building work.
- 3.6 Following this, the authority carried out a site inspection of all of the building work on 18 July 2009. On 21 July 2009, the authority sent the owners of unit 4 a letter stating that the interim code compliance certificates for units 1 and 3 were now redundant and that the authority was not prepared to issue a new code compliance certificate for all of the building work, because this would 'effectively start the durability clock on building elements that have been in place for 14 years'. The letter also suggested that the applicants should apply for a determination to resolve the matter.
- 3.7 The complete application for a determination was received on 8 October 2009.

#### **4. The submissions**

- 4.1 The applicants made a submission dated 23 September 2009, which included copies of correspondence from the authority, the 1996 LIM report (refer to paragraph 3.2), the records of the inspection carried out by the authority, and a property inspection report carried out by a property inspection company.
- 4.2 The authority acknowledged the application but made no submission.
- 4.3 A draft determination was sent to the parties on 16 February 2010. The parties accepted the draft without comment.

## 5. The expert's report

5.1 As mentioned in paragraph 1.4, I engaged an 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 filed his report on 10 December 2009 and a copy was sent to the parties for comment on 17 December 2009.

5.2 The expert made three site visits to the townhouses at the beginning of December 2009. During these visits he visually inspected the building and carried out invasive and non-invasive moisture testing. He also removed a section of the external cladding and a sample of the structural timber, which was sent away for laboratory testing and analysis by a wood and building materials specialist.

### Moisture levels

5.3 The expert took non-invasive readings in the interiors of units 1 and 3. A reading taken at the timber skirting of the lounge area in unit 1 showed moisture levels of 25% and visible signs of moisture damage. The non-invasive tests to the interior of unit 3 did not give elevated readings.

5.4 The expert carried out 25 invasive moisture testing at numerous at-risk locations on the townhouses' external walls. 15 of those were elevated as follows:

#### Unit 1

- 24% at the roof to wall junction on the south elevation
- 24% at the roof to wall junction on the north elevation
- 24% above the window head and below the canopy roof to wall junction on the south elevation
- 71% and 52% at the bottom plate below the roof to wall junction on the west elevation (on the northern side)

#### Unit 2

- 25% and 18% at the upper window sill on the south elevation
- 24% at the canopy roof to wall junction on the south elevation
- 24% at the lower window sill on the south elevation

#### Unit 3

- 21% at the lower window sill on the south elevation

#### Unit 4

- 19% at the lower window sill on the south elevation
- 19% at the upper window sill on the west elevation
- 38% at the lower window sill on the west elevation

- 5.5 The very high reading of 71% was taken at a point on the bottom plate line below a unit 1 roof to wall junction. The external cladding was removed at this location and a reading of 52% was recorded in the bottom plate framing. Readings of over 40% indicate that the wood is saturated and decay will be inevitable over time.
- 5.6 A sample of the timber was removed from the stud and sent for laboratory testing. The test report confirmed the presence of well-established decay and toxic mould in the timber, due to exposure to moisture, and stated that the timber would need to be replaced.

### **Weathertightness observations**

- 5.7 The expert noted the cladding was generally of a reasonable standard although it displayed several features and defects that could further compromise its weathertightness. The invasive tests confirmed that the cladding consisted of a two-coat plaster system on a low-density fibreboard substrate. The expert raised this as a potential risk, as although two-coat systems were common at the time that the building was constructed, the New Zealand standard<sup>4</sup> that was current at the time that the building consent was issued required a three-coat system to be used.
- 5.8 Commenting on the weathertightness detailing, the expert noted:

#### **The cladding**

- there was cracking to the cladding at window sills, at head junctions and at roof to wall junctions
- there are areas where spouting ends were embedded into the stucco
- in some areas the clearances and protection between the ground and bottom of the cladding were inadequate
- there was no evidence of horizontal or vertical control joints in the cladding

#### **The flashings**

- there were no sill or jamb flashings
- at the lounge window to unit 3 there is no timber lintel installed, no head flashing and no visible sill or jamb flashings so the window is relying on sealant to prevent moisture ingress
- metal head flashings do not extend past window openings
- sealant has been provided at some but not all of the head flashing to window jamb junctions
- apron flashings at roof and wall junctions had inadequate turn up, spouting embedded into the plaster and inadequate clearances between the cladding and apron flashing
- apron flashings at roof and wall junctions have had a more robust kick out flashing and plaster repairs

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<sup>4</sup> New Zealand Standard NZS 4251: 1974 *Code of Practice for Solid Plastering*.

**The balcony membranes**

- the membranes on the balconies had been embedded behind the stucco cladding
- the metal balustrade fixings had been installed with penetrations through the balcony membrane

**Matter 1: The external envelope****6. Discussion**

- 6.1 The approach taken in determining whether building work is weathertight and durable, and is likely to remain so, is to apply the principles of weathertightness. This involves the examination of the design of the building, the surrounding environment, the design features that are intended to prevent the penetration of water, the cladding system, its installation, and the moisture tolerance of the external framing. The Department and its antecedent, the Building Industry Authority, have also described weathertightness risk factors in previous determinations (for example, Determination 2004/1) relating to cladding and these factors are also used in the evaluation process.
- 6.2 The consequences of a building demonstrating a high weathertightness risk is that building solutions that comply with the Building Code will need to be more robust. Conversely, where there is a low weathertightness risk, the solutions may be less robust. In any event, there is a need for both the design of the cladding system and its installation to be carefully carried out.
- 6.3 I have evaluated the house using the risk matrix in E2/AS1. The risk matrix allows the summing of a range of design and location factors applying to a specific building design. The resulting risk level can range from low to very high and is applied to determine what claddings can be used on a building in order to comply with E2/AS1. Higher risk levels will require more rigorous weatherproof detailing.

**Weathertightness risk**

- 6.4 The house has the following environmental and design features which influence its weathertightness risk profile:

**Increasing risk**

- it is two storeys high
- it has decks built over living areas
- its roof to wall joins are fully exposed
- the eaves are 0-300mm deep
- there are enclosed balconies, exposed in plan at the first floor level

**Decreasing risk**

- it is located in a medium wind zone
- it is fairly simple in plan and form

- 6.5 When evaluated using the E2/AS1 risk matrix, these features show that the house demonstrates a high weathertightness risk rating to three elevations of the building and a medium weathertightness risk rating to the other elevation. If the current details of E2/AS1 were adopted to show code compliance, a drained and ventilated cavity would be required.

### **Weathertightness performance**

- 6.6 It is clear from the expert's report that the plaster cladding installed on the house is unsatisfactory in terms of its weathertightness because elevated moisture levels were recorded and decayed timber framing identified.
- 6.7 I note the two coat plaster system is not in accordance with the requirements of the standard at the time the building consent was issued.
- 6.8 Taking into account the expert's comments outlined in paragraph 5.8, I conclude that the following items require rectification with respect to the weathertightness of the building:
- the defects to the cladding, including the cracking, the lack of control joints, the spouting ends embedded into the plaster, and the inadequate ground clearances
  - the lack of sill and jamb flashings, the lack of head flashings to the lounge window at unit 3, the insufficient extension of the metal head flashings past the window openings, the inadequate detailing of the apron flashings
  - the embedment of the balcony membrane to the plaster and the penetration of the membrane at the metal balustrade fixings.
- 6.9 Further investigation is necessary to determine the extent of decay and the full extent of the repairs required.

### **Weathertightness conclusion**

- 6.10 I consider the expert's report establishes that the current performance of the external envelope is not adequate because there is evidence of moisture ingress into the house. In particular, the external envelope demonstrates the key defects listed in paragraph 6.8, which are likely to have contributed to the moisture penetration evident within the building.
- 6.11 I have also identified the presence of a range of known weathertightness risk factors in this house. The presence of the risk factors on their own is not necessarily a concern, but they have to be considered in combination with the significant faults that indicate that the structure does not have sufficient provisions that would compensate for the lack of a drained and ventilated cavity.

- 6.12 In addition, the building work is also required to comply with the durability requirements of Clause B2. Clause B2 requires that a building continues to satisfy all the objectives of the Building Code throughout its effective life, and that includes the requirement for the house to remain weathertight. Because the faults to the external envelope may all further ingress of moisture in the future, the building work does not comply with the durability requirements of Clause B2.
- 6.13 I find that, because of the extent and complexity of the faults that have been identified, the 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. This 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.
- 6.14 I also note that effective maintenance of claddings is important to ensure ongoing compliance with Clauses B2 and E2 of the Building Code, and is the responsibility of the building owner. The Department has previously described these maintenance requirements, including examples where the external wall framing of the building may not be treated to a level that will resist the onset of decay if it gets wet (for example Determination 2007/60).

## **Matter 2: The durability considerations**

### **7. Discussion**

- 7.1 There are concerns about the durability, and hence the compliance with the Building Code, of certain elements of the building, taking into consideration the substantial completion of the building work in 2001.
- 7.2 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 (“durability periods”) ‘from the time of issue of the applicable code compliance certificate’ (Clause B2.3.1).
- 7.3 In previous determinations (for example Determination 2006/85) I have taken the view that a modification of this requirement can be granted, if I am satisfied that the building complied with the durability requirements at a date earlier than the date of issue of the code compliance certificate, that that date is agreed by the parties and that, if there are matters that are to be fixed, they are discrete in nature.
- 7.4 Because of the extent of the defects to the external envelope of the building and the likely consequential impact on the building’s timber framing, 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 cladding and all associated work has been made code compliant.



## **8. What is to be done now?**

- 8.1 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 6.8 and refer to any further defects that might be discovered in the course of investigation and rectification. The notice should not specify how those defects are to be fixed and the building brought into compliance with the Building Code, as that is a matter for the owners to propose and the authority to accept or reject.
- 8.2 In response to the notice to fix, the owners 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.

## **9. The decision**

- 9.1 In accordance with section 188 of the Building Act 2004, I determine that the external envelope of the building does not comply with Clauses B2 and E2 of the Building Code, and accordingly I confirm the authority's decision to refuse to issue a code compliance certificate.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 15 March 2010.

John Gardiner  
**Manager Determinations**