



Determination 2010/061

Refusal to issue a code compliance certificate for alterations to a house at 31B Balmain Road, North Shore



1. The matters 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.

1.2 The parties are:

- Mr KG Turner acting on behalf of the KG and KG Turner Family Trust, the owner of the house, (“the applicant”)
- North Shore City Council carrying out its duties and functions as a territorial authority or building consent authority (“the authority”).

1.3 This determination arises from the decision of the authority to refuse to issue a code compliance certificate for alterations to a house, because it was not satisfied that they complied with Clauses B2 Durability and E2 External Moisture².

¹ The Building Act, 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.

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.

1.4 The matter to be determined³ is whether the decision of the authority to refuse to issue a code compliance certificate was correct. In making this decision, I must consider:

1.5 Matter 1: The external envelope

1.5.1 Whether the external envelope of the house 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.

1.6 Matter 2: The durability considerations

1.6.1 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.

1.7 In making my decision, I have considered the submissions of the parties, 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

2.1 The property is a two storey, detached house and is situated on a sloping section, which faces roughly west. It is in a high wind zone for the purposes of NZS 3604⁴.

2.2 The original single storey house was built in the 1960s. In 2001, the original house was lifted up to create a new ground floor level beneath it. It is this new ground floor level that is the subject of this determination.

2.3 The architecture of the entire house is generally simple. The house has timber piles, apart from the garage, which is built over a concrete floor slab. The floors of both the upper and lower storey are timber framed. The floor joist timbers have been boron treated. The lower floor is formed from particle board.

2.4 The external walls of the upper storey retain their original treated timber framing, which has been re-clad with PVC weatherboard cladding. The external walls of the lower storey are framed with untreated light timber. The lower level is clad with 40mm expanded polystyrene cladding, apart from the eastern side of the garage, which is clad with fibre cement board. The lower level cladding is direct fixed to the framing timber and has a plaster finish, which is around 6mm thick.

2.5 The roof is a gable end design pitched at 15°. It is light timber framed and is clad with corrugated roofing iron on the upper level and corrugated colour steel on the lower. There are eaves on both the upper and lower storeys of the house with exposed beams and skillion roof construction in places.

³ Under section 177(b)(i) of the Building Act 2004.

⁴ New Zealand Standard NZS 3604: 1999 Timber Framed Buildings.

- 2.6 Powder-coated aluminium joinery has been used throughout and the interior is lined mainly with painted plasterboard.
- 2.7 A central balcony with a pergola structure over it has been built directly over the lounge. The balcony is accessed from the master bedroom. There is also a wooden open slat deck on parts of the house's northern and western sides, which also has pergola structures above it.

3. Background

- 3.1 The authority issued a building consent (number BA/00679/01) under the Building Act 1991 on 15 May 2001. The consent was for alterations to the existing house, which involved lifting up the existing house and building a new floor beneath it. A revised consent was subsequently issued on 30 July 2001 to change the type of monolithic cladding that would be used.
- 3.2 The building work was substantially completed in November 2001 and the house was occupied at that point. An inspection carried out by the authority on 31 October 2001 raised several matters that needed to be resolved and the applicant states that these were seen to in early 2002.
- 3.3 On 9 February 2005 the authority carried out a final inspection of the building work. The field memorandum from the inspection listed three matters to be attended to, including providing a producer statement for the ground floor cladding system and booking a weathertightness inspection.
- 3.4 On 9 February 2005 the authority also wrote to the applicant advising that:
- Consented building works in North Shore City Council clad with any type of monolithic cladding without a cavity, will be reviewed on a case by case basis before determining if a code compliance certificate (CCC) can be issued.

The letter requested that the applicant arrange a time for the authority to carry out a weathertightness inspection of the house. After the inspection, the authority would decide whether or not to issue a code compliance certificate for the house.

- 3.5 The weathertightness inspection was carried on 12 July 2005. On 1 August 2005, the authority wrote to the applicants again about the applicant's request for a code compliance certificate. The letter lists the weathertightness risk factors and 12 "identified defects" found during a "visual inspection" of the applicant's house. The letter concludes that:
- Due to the risk factors involved and identification of some defects, Council cannot be satisfied on reasonable grounds that the cladding system as installed, will meet the functional requirements of clause E2, External Moisture and clause B2, Durability of the New Zealand Building Code. Therefore Council is unable to issue a code compliance certificate for this consent.

The letter advised the applicant of the option of applying for a determination.

- 3.6 The application for a determination was received by the Department on 2 March 2010.

4. The submissions

- 4.1 In an information sheet dated 18 February 2010 supporting the application for a determination, the applicant noted (among other things) that:
- The house has been occupied for approximately 9 years. Obviously, during that time a wide variety of adverse weather has been experienced. The house is warm and dry and there have been no leaks or indications of moisture or mould. A thorough examination of the monolithic cladding reveals no cracks, no evidence of failure of sealing around any aluminium joinery and it is in excellent condition.
- 4.2 The applicant also provided copies of:
- the producer statement for the expanded polystyrene external cladding system used on the lower floor
 - an itemised invoice for the floor and external wall framing timber used in the alterations
 - various items of correspondence from the authority.
- 4.3 The draft determination was issued to the parties on 28 May 2010. The draft was issued for comment and for the parties to agree a date when the building work, with the exception of any matters that are to be fixed, complied with Clause B2 Durability.
- 4.4 The authority accepted the draft with non-contentious comments in correspondence to the Department dated 15 June 2010. The submission enclosed a copy of the inspector's report of the visual weathertightness inspection, carried out by the authority (refer paragraph 3.5). The submission questioned whether the determination should refer to the lack of a 'saddle flashing at each of the balcony barrier cap flashing' and lack of 'cap flashings to the top of the [two] pergola posts that project from the deck barrier'.
- 4.5 The applicant accepted the draft with non-contentious comments in correspondence to the Department received on 17 June 2010. The submission pointed out a typographical error and asked whether:
- ... a "suitably qualified person" is not defined and any such person is therefore to be selected at my discretion.
- ... reference to "undertaking a thorough investigation the external envelope" (a) refers to examination of the locations of the defects listed in pare 6.5.2 to enable remedial measures to be proposed and (b) does not mean a further investigation of the external envelope is required in addition to that already performed ...
- 4.6 The applicant is able to use any 'suitably qualified person' to undertake any further investigation. However, my advice would be that such a person is a member of the New Zealand Institute of Building Surveyors, or has a similar qualifications and experience. Any further investigation is in respect of the defects listed in paragraph 6.5.2 and matters associated with those defects. It does not mean a further general investigation of the external envelope.
- 4.7 I have taken account of the submissions and amended the determination accordingly.

- 4.8 Both parties agreed that compliance with B2 Durability, with the exception of those items to be rectified, was achieved on 1 March 2002.

5. The expert's report

5.1 General

- 5.1.1 As mentioned in paragraph 1.7, I engaged an independent expert to provide an assessment of the external envelope of the house. The expert is a member of the New Zealand Institute of Building Surveyors. The expert filed his report on 27 April 2010 and a copy of this was provided to the parties on 30 April 2010.
- 5.1.2 The expert noted five areas where the house had not been built according to the plans. For the purpose of this determination, the most significant of these was that a different external cladding system had been used on the alterations than the one that had been consented in the revised consent dated 30 July 2001. However, the expert noted that (with the exception of the garage wall, which was clad with fibre cement board) the cladding system was similar to the system that had been consented. A different membrane (fibre-reinforced liquid applied membrane) had also been used on the balcony floor than the one that had been consented (butyl rubber membrane).
- 5.1.3 The expert noted that the cladding system appeared to be in good condition, with no cracks noted, although there were some deficiencies in the detail of the cladding's installation and some blemishes.
- 5.1.4 The expert also noted that the applicant had rectified some of the weathertightness details identified by the authority in its letter of 1 August 2005.

5.2 Moisture levels

- 5.2.1 The expert inspected and carried out non-invasive moisture testing of the interior of the house and found no signs of leaks or elevated moisture readings.
- 5.2.2 The expert also carried out invasive moisture testing at numerous points on the external walls of the house's lower floor. Only two readings that exceeded 18% were returned. These were both recorded at the left-hand side of the front entry door, with 22% recorded for the wall framing and 20% for the treated floor joist below it.
- 5.2.3 The expert attributed these high readings to the ground beneath the house at this point being currently damp, and showing signs of wetness and pooling during winter. The expert's opinion was that this under-floor dampness was causing moisture vapour to rise up into the framing timbers.
- 5.2.4 The expert also noted that the readings were taken following a prolonged stretch of dry summer weather, and that "readings can vary significantly between summer and winter".
- 5.2.5 The expert removed one timber sample from below the roof junction on the front north-eastern corner of the garage where the timber framing had some stain markings. The sample was sent for laboratory testing. Testing showed that the

sample was sound and could be left in situ provided moisture levels did not exceed 18%.

5.3 Weathertightness observations

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

Cladding

- There were no vertical control joints (as required) in the fibre cement cladding on the garage's eastern wall.
- The fibre cement cladding did not extend beyond the door sill flange on the family room doors.
- The eastern end of the fibre cement cladding does not comply with the minimum foundation overlap.
- The expanded polystyrene cladding across the front door has limited overlap on the boundary joists.

Ground clearance

- The basement wall cladding is in contact with the garden soil in places where there should be a 50mm clearance.
- Ground clearances are also inadequate across the garage, although the expert noted that good paving falls exist across the garage entry.

Flashings

- PVC flashings had been used around the windows and doors.
- One of the junctions between the roof and the wall on the eastern garage wall had not been well sealed. However decay analysis carried out on the wall framing below this point showed no evidence of decay.
- Cap flashings on the balcony barrier walls had not been fitted with drainage falls and had been butt sealed into the pergola posts. Flashings had subsequently been fitted around the pergola posts but remained clear of the cap flashings. However, moisture readings taken from the wall framing adjacent to the pergola post's junction with the wall were low (11%) and there were no signs of water ingress.
- Some flashing joints below the cap flashings on the balcony barrier walls were inadequate.

Penetrations

- There was cracked sealant around a sewer pipe wall penetration.
- The electrical meter box on the garage did not have a flashing although it appeared to be well sealed.

5.4 Response to the report

5.4.1 In response to the expert's report, in a letter dated 3 May 2010, the applicant noted:

- The base wall cladding has since been cut way to provide a minimum 50mm clearance.
- The cap flashings on the balcony barrier walls are not butt sealed but have upturns at the posts. The posts have been completely clad, overlapping the capping upturns, with the cladding packed so as to leave a ventilation gap between the post and the cladding.
- The flashings deemed to have been overlapped in the wrong way is in fact a cosmetic detail. The green flashing is not part of the waterproof (dark grey) flashing but has been inserted to create a water drip clear of the cladding to prevent dirt streaking.

6. Discussion of Matter 1: the external envelope

6.1 The approach in determining whether building work is weathertight and durable and is likely to remain so, is to examine 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. Weathertightness risk factors have also been described 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 will need to be more robust in order to comply with the Building Code. 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.

6.4 Weathertightness risk

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

Increasing risk

- it is in a high wind zone
- it is two storeys high
- there is an enclosed deck, exposed in plan at first floor level

Decreasing risk

- the eaves width is generally between 450 mm and 600 mm to all elevations
- the roof to wall junctions are generally protected
- the house's plan and form is of low complexity.

6.4.2 When evaluated using the E2/AS1 risk matrix, these features show that the house demonstrates a high weathertightness risk rating. If the details shown in the current E2/AS1 were adopted to show code compliance, a drained cavity would be required. However, this was not a requirement when this house was constructed.

6.5 Weathertightness performance

6.5.1 In general, the claddings appear to have been well installed, in accordance with good trade practice. Although the cladding is fixed directly to the timber framing there is no evidence that, since it was installed in 2001, it has not performed and allowed moisture to penetrate the building envelope.

6.5.2 However, taking account of the expert's comments in paragraph 5, I conclude that remedial work is required in respect of the following defects:

- the moisture rising from the ground and pooling under the house by the front door
- the lack of control joints and sealing to the lower edges to the cladding on the garage's eastern wall
- junctions between the fibre-cement sheet in-fills and cladding below door and window sill flanges
- the clearance between the cladding and the garden soil and paving in places
- the inadequately sealed junction between the roof and the wall on the eastern garage wall
- the cap flashings and the joints below them on the balcony barrier walls, and the lack of saddle flashings
- the sealant around the sewer pipe wall penetration and meter box.

6.6 Weathertightness conclusion

- 6.6.1 I consider that the expert's report establishes that the current performance of the external envelope is not adequate as it is allowing moisture to penetrate the house below the front door area. As such, the house does not currently comply with Clause E2 of the Building Code.
- 6.6.2 In addition, the house is 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 allow further ingress of moisture in the future, the building work does not comply with the durability requirements of Clause B2.
- 6.6.3 I draw attention at this point of the importance of effective maintenance of claddings to ensure ongoing compliance with Clauses B2 and E2 of the Building Code. This maintenance 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 is not treated to a level that will resist the onset of decay if it gets wet (for example, Determination 2007/60).

7. Discussion of Matter 2: the durability considerations

- 7.1 Clause B2.3.1 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. These durability periods are:
- 5 years if the building elements are easy to access and replace, and failure of those elements would be easily detected during the normal use of the building
 - 15 years if building elements are moderately difficult to access or replace, or failure of those elements would go undetected during normal use of the building, but would be easily detected during normal maintenance
 - the life of the building, being not less than 50 years, if the building elements provide structural stability to the building, or are difficult to access or replace, or failure of those elements would go undetected during both normal use and maintenance.
- 7.2 The alterations to the house are now nine years old. This means some elements of the house are now well through, or at the end of, their required durability periods, and would consequently no longer comply with Clause B2, if a code compliance certificate was issued effective from today's date.
- 7.3 It is not disputed, and I am therefore satisfied, that all the building elements complied with Clause B2 on 1 March 2002. This date has been agreed between the parties, refer paragraph 4.8.
- 7.4 In order to address these durability issues when they were raised in previous determinations, I sought and received clarification of general legal advice about waivers and modifications. That clarification, and the legal framework and

procedures based on the clarification, are described in previous determinations (for example, Determination 2006/85). I have used that advice to evaluate the durability issues raised in this determination.

7.5 I continue to hold the views expressed in the previous determinations, and therefore conclude that:

- the authority has the power to grant an appropriate modification of Clause B2 in respect of all of the elements of the building
- it is reasonable to grant such a modification, with appropriate notification, because in practical terms the building is no different from what it would have been if a code compliance certificate had been issued in 2001.

7.6 I strongly suggest that, once the final determination has been issued, the authority should record the determination, and any modification resulting from it, on the property file and any LIM issued concerning this property.

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 paragraph 6.5.2 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 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.

8.3 I strongly suggest that once the final determination has been issued the authority should record the determination, and any modification resulting from it, on the property file and any LIM issued concerning this property.

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.

9.2 I also determine that:

- a) all the building elements installed in the house, apart from the items that are to be rectified as described in this determination, complied with Clause B2 on 1 March 2002.

- b) the building consent is hereby modified as follows:

The building consent is subject to a modification to the Building Code to the effect that, clause B2.3.1 applies from 1 March 2002 instead of from the time of issue of the code compliance certificate for all the building elements, except for the items to be fixed as set out in paragraph 6.5.2 of Determination 2010/061.

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

John Gardiner
Manager Determinations