



## Determination 2010/032

### Refusal to issue a code compliance certificate for a 15-year-old house at 39 Ledbury Road, Nelson



#### 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.
- 1.2 The applicants are the owners of the house, J Chambers and W Wilson (“the applicants”). The other party is the Nelson City Council (“the authority”), carrying out its duties as a territorial authority or building consent authority.
- 1.3 The determination arises from the decision of the authority to refuse to issue a code compliance certificate for a 14-year-old house, because it was not satisfied that it complied with Clauses B2 and E2 of the Building Code (First Schedule, Building Regulations 1992).

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<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.

1.4 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:

### **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 house.

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 other evidence in this matter.

## **2. The building work**

2.1 The building is a three-level house, built during 1995 and 1996, with a moderately complex design. It is situated on a moderately sloping site, in an established residential area, which is in a high wind zone for the purposes of NZS 3604<sup>3</sup>.

2.2 The house has poured concrete foundations and ground floor slab, with pre-cast concrete and light timber framed walls above. The wall framing is Douglas fir and is unlikely to be treated. The external walls have three types of cladding: 40mm EIFS<sup>4</sup> direct fixed to the framing, texture coated 6mm fibre cement board direct fixed over wall underlay to the framing, and texture coated pre-cast concrete.

2.3 The roof is long-run corrugated steel and is at a nominal pitch of 30°. Roof design is predominantly hip and gable, with eaves widths varying from storey to storey, but generally between 150mm and 600mm. The house has powder-coated aluminium framed doors and windows, and an open timber deck at ground level in its north-west corner.

## **3. Background**

3.1 The authority issued a building consent for the house on 23 March 1995. The authority carried out a number of inspections of the building work during 1995 and 1996, including a final inspection on 16 September 1996, all of which required re-inspection. On 18 February 1998, the authority wrote to the applicants, requesting

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<sup>2</sup> Under sections 177(a) and 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.

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

<sup>4</sup> Exterior Insulation and Finish System

that they arrange an inspection date so that a code compliance certificate could be issued.

- 3.2 A further final inspection was carried out on 24 June 2005, which again failed and required re-inspection. Following this inspection, the authority wrote to the applicants on the same day, acknowledging the application for a code compliance certificate and stating that:

Due to the time that has elapsed since this work was undertaken Nelson City Council cannot be satisfied on reasonable grounds that the work now meets all the requirements of the Building Code, especially B2 Durability and E2 External moisture. Because of this Nelson City Council will not be in a position to issue a Code Compliance Certificate.

- 3.3 The applicants contacted the authority on 23 September 2009 requesting another final inspection. This inspection was carried out on 6 October 2009. The final inspection report listed numerous matters that needed to be rectified.
- 3.4 The applicants made an application for a determination which was received by the Department on 9 November 2009. The Department requested further information from the applicants and this was supplied on 22 November 2009.

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

- 4.1 In their letter dated 22 November 2009, the applicants stated that they had received one letter dated 18 February 1998 from the authority, but that “no further follow up was made after this”. The applicants also disputed most of the items raised in the final inspection report of 6 October 2009, stating that they felt that these should have been passed and the reasons why. The applicants listed several additional items that they stated had, or would be rectified, including the deck balustrade, garden levels, cladding to roof junctions, and extractor vent boot flashing.
- 4.2 The applicants also forwarded copies of:
- the authority’s letter of 18 February 1998
  - photos of the house during construction
  - copies of trade invoices relating to the building work
  - producer statement (PS4) construction review completed by a consulting structural engineer with respect to the house’s basement retaining walls and steel beams on 4 April 1996.
- 4.3 The authority acknowledged the application for a determination and enclosed a copy of its inspection records and correspondence relating to the applicants’ house.
- 4.4 The draft determination was issued to the parties on 15 March 2010. The draft was issued for comment and for the parties to agree a date when the building work, with the exception of the items to be fixed, complied with Clause B2 Durability. The parties accepted the draft without comment.

- 4.5 The applicants submitted that compliance with Clause B2 was achieved on the day the house was first occupied in 24 December 1995. The authority accepted this position.

## **5. The expert's report**

- 5.1 As mentioned in paragraph 1.7, I engaged an expert to provide an assessment of those building elements subject to the determination. The expert is a member of the New Zealand Institute of Building Surveyors. He filed his report on 9 February 2010 and a copy was sent to the parties on 16 February 2010.
- 5.2 The expert made two site visits to the house on 5 and 8 January 2010. Both days were fine and sunny. In addition to visually inspecting the house, he carried out invasive and non-invasive moisture testing at several locations, and removed a small section of the cladding for inspection.
- 5.3 The expert noted that the house appeared to have been built in accordance with the plans, other than the deck, which had a different layout than that shown on the building consent drawings. He also noted that, in general, the workmanship was of a good quality.

### **5.4 Moisture levels**

- 5.4.1 The expert took non-invasive moisture readings at numerous locations on the interior face of the external walls. All readings were within the acceptable range.
- 5.4.2 The expert also carried out invasive moisture testing of the framing at nine at-risk locations on the house's external walls. Four of these were elevated as follows:
- 21% at the bottom plate on the north elevation
  - 18% at high ground level by the planter on the north elevation
  - 18% at two locations on the bottom plate on the west elevation
  - 21% beneath the spouting on the east elevation.
- 5.4.3 The equilibrium moisture content was in the region 10-13%.

### **5.5 Weathertightness observations**

- 5.5.1 Commenting on the weathertightness detailing, the expert noted the following:

#### **Cladding**

- All three types of cladding used on the house were in good condition, although the cladding required repainting.
- There was one hair line crack in the EIFS cladding where the deck barrier met the house, although invasive moisture testing carried out at this location did not return a high reading.

- The EIFS cladding used is no longer on the market, and current EIFS systems would typically require wall underlay beneath them. However, there was no evidence to suggest that the lack of underlay was causing problems.
- The pre-cast concrete panels are in sound condition, with adequate polythene tanking and no evidence of moisture-related issues.
- No mechanical or back flashings had been installed between the various cladding systems used on the house. The plaster system that covers the EIFS cladding had been continued over all the cladding types, with all junctions between the cladding types covered with fibreglass reinforcing mesh, integral with the plaster system. There was no cracking at any of these junctions.
- In general, service penetrations through the cladding had been sealed, although there was a gap at a service entry in a pre-cast concrete panel on the west wall.
- The deck has been sealed to the EIFS cladding on the north-west elevation.
- The spouting runs into the EIFS cladding on the east elevation and this has caused moisture to enter the wall framing at this location. The spouting also runs into the cladding on the west elevation.

### **Framing**

- In areas where the cladding had been “opened up”, there was no evidence that the Douglas fir framing had been treated.

### **Flashings, windows and doors**

- The EIFS cladding is well sealed to the window and door frames, with no cracking present.
- Joinery in the EIFS cladding has embedded plastic sill flashings but no head or jamb flashings. This is mitigated by good eaves overhang and good sealing between the frames and cladding.
- No flashings were evident around windows in the pre-cast concrete panels, although the windows were well-sealed into rebates in the panels, with no signs of cracking.
- There is a gap above the garage door jambs where the jambs run up to the underside of the fascia.
- Although there are apron flashings at the junctions between the EIFS cladding and the roof, there were no kickout flashings at the bottom of the apron flashings at locations where the spouting runs into the cladding.
- There are no drip edges at the bottom of the claddings at paving and roof apron flashings.

### **Roof**

- The roof vent boot flashing on the east side is trapping water.
- The roof relies on sealant in places for weathertightness.
- There are minor maintenance items required to the roof.

### Ground levels

- Ground levels (paved and unpaved) had been carried up over the base of the EIFS and fibre cement board cladding at locations on the house's east, west and north elevations. This has caused moisture to enter the bottom plate at these locations.
- Cladding clearance from the paving at the back porch is inadequate.

## 5.6 Other observations

- 5.6.1 The expert noted that, in many places, the building relied on sealants as a "first line" barrier to the entry of moisture. As sealants have limited durability, the expert considered that it would be important to regularly inspect and, where necessary, replace these sealants to ensure that the house remained weathertight.
- 5.6.2 The expert also noted various other matters, raised by the authority in its final inspection of 6 October 2009, and commented that:
- there is insufficient clearance from the insulation to the downlights
  - the swimming pool barrier does not comply with Clause F4.
- 5.6.3 The expert has noted the lack of a smoke detector near the master bedroom. I note that the provision of domestic smoke detectors in the Acceptable Solution for Building Code Clause F7 Warning Systems, F7/AS1, did not come into effect until April 2003. The building consent for the house was issued in March 1995 and subsequent changes to the Building Code (and any associated changes to the relevant Acceptable Solutions) cannot be enforced retrospectively. However, irrespective of this I strongly suggest that the smoke detector be installed.

## Matter 1: The external envelope

### 6. Discussion

- 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 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.

## **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.
- In places, it is three storeys high.
- Its roof and wall junctions are exposed in places.
- Some eaves are between 0 to 150mm.

### **Decreasing risk**

- Its plan and form is of medium complexity.
- There is a timber deck at ground level, but no raised or enclosed decks.

6.4.2 When evaluated using the E2/AS1 risk matrix, these features show that the house demonstrates a medium to high weathertightness risk rating. I note that this means that if the current details of E2/AS1 were adopted to show code compliance, a drained and ventilated cavity would be required. However, this was not a requirement at the time of construction in 1995.

## **6.5 Weathertightness performance**

6.5.1 Generally, the cladding appears to have been well installed and is in good condition. However, it is clear from the expert's report that in certain discrete areas, particular aspects of the building work are allowing moisture to enter the cladding or could do so in the future. This is demonstrated by the elevated moisture readings returned at some locations around the house. It is important to note in this regard that these readings were taken at a time when the weather had been sunny and windy with little rain and that the elevated readings were significantly higher than the base readings for the house. These environmental factors would lower moisture levels and it is likely that if equivalent readings were taken in winter they would be higher, possibly reaching levels where decay could be initiated.

6.5.2 Taking into account the expert's report and comments outlined in paragraph 5.5.1, I conclude that the following items require rectification with respect to weathertightness:

- the gap at a service entry in the west wall should be sealed
- the gap at the top of the garage door jamb needs to be sealed
- a 12mm gap should be established between the decking and the EIFS cladding on the north-west elevation
- the spouting needs to be removed from the cladding on the east and west elevations, with a 10mm clearance established, the cladding made good, and kickout flashings fitted at the bottom of the apron flashings

- correct ground levels need to be established in areas where they currently do not comply, with planted areas moved away from claddings and slot drains installed in places to achieve sufficient clearances
- the roof boot flashing should be flashed over to prevent water pooling.

6.5.3 Further investigation is necessary to determine any other matters that may require rectification. I note however, that in general the cladding is working well to prevent moisture ingress and that, once these discrete matters have been fixed, will comply with Clause E2 of the Building Code.

6.5.4 I note also that although the windows and doors lack jamb and head flashings, this is compensated for by wide eaves in most places, and good sealing between the frames and the cladding. In places where windows are not protected by eaves they are installed in pre-cast concrete wall panels, and if they leaked the durability of the house would not be compromised.

6.5.5 As discussed in paragraph 5.6.2, I note there are also minor non-weathertightness items that contravene the relevant requirements of the Building Code.

## **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 at the bottom plate on the north elevation and by the spouting on the east elevation. 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 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). I draw particular attention to the expert's observations, as recorded in paragraph 5.6.1, about sealants, and the need for them to be regularly checked and replaced.

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

### **7. Discussion**

7.1 The authority has concerns about the durability, and hence the compliance with the Building Code, of the house, taking into account the age of the building work.



- 7.2 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.
- 7.3 The 15 year delay between when the building work was carried out in 1995, and the applicants’ request for a code compliance certificate has raised concerns with the authority that various 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 that was effective from today’s date.
- 7.4 It is not disputed, and I am therefore satisfied, that all the building elements complied with Clause B2 on 24 December 1995. This date has been agreed between the parties, refer paragraph 4.5.
- 7.5 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, is described in previous determinations (for example, Determination 2006/85). I have used that advice to evaluate the durability issues raised in this determination.
- 7.6 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 1995.
- 7.7 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 the non weathertightness items listed in paragraph 5.6.2, 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 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.
- 8.3 Once the agreed matters have been rectified to both parties' satisfaction, the authority may issue a code compliance certificate in respect of the building consent as amended, refer paragraph 9.2.

## **9. The decision**

9.1 In accordance with section 188 of the Building Act 2004, I determine that the external envelope 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, complied with Clause B2 Durability on 24 December 1995.
- 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 24 December 1995 instead of from the time of issue of the code compliance certificate for all of the building elements, except for the items to be rectified as set out in paragraphs 6.5.2 and 5.6.2 of Determination 2010/032.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 8 April 2010.

John Gardiner  
**Manager Determinations**