

## Determination 2007/63

### Determination regarding a code compliance certificate for a house with weatherboard and monolithic claddings at 4 Peppertree Way, Nelson



#### 1 The matter 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 that Department. The applicant is the owner, Mr Rollo (“the applicant”), and the other party is Nelson City Council (“the territorial authority”).
- 1.2 This determination arises from the decision of the territorial authority to refuse to issue a code compliance certificate for a 10-year-old house because it is not satisfied that it complies with clauses B2 “Durability” and E2 “External Moisture” of the Building Code<sup>2</sup> (First Schedule, Building Regulations 1992).

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<sup>1</sup> The Building Act 2004 is available from the Department’s website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

<sup>2</sup> The Building Code is available from the Department’s website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

1.3 The matters for determination are whether:

**1.3.1 Matter 1: The cladding**

the cladding as installed on the house (“the cladding”) complies with clause E2 “External Moisture” of the Building Code. By “the cladding as installed” I mean the components of the system (such as the backing materials, the flashings, the joints and the plaster and/or the coatings) as well as the way the components have been installed and work together.

**1.3.2 Matter 2: The durability considerations**

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 submissions of the parties, the report of the independent expert commissioned by the Department to advise on this dispute (“the expert”), and the other evidence in this matter. I have evaluated this information using a framework that I describe more fully in paragraph 6.1.

1.5 In this determination, unless otherwise stated, references to sections are to sections of the Act and references to clauses are to clauses of the Building Code.

## **2 The building**

2.1 The building work consists of a two-storey detached house situated on a flat site, which is in a medium wind zone for the purposes of NZS 3604<sup>3</sup>. The construction of the house is conventional light timber frame, with a concrete slab and foundations, monolithic and weatherboard claddings and timber windows. A rimu floor, on 50mm x 50mm battens, is laid above the concrete slab. There is a 100mm x 75mm packer beneath the bottom plates of the wall framing.

2.2 The house is fairly simple in plan, but has a moderately complex roof form accommodating the partial upper floor. The 40° pitch profiled-metal roof has no eaves or verge projections, and incorporates hips, gables, several ‘dutch’ gables and a lean-to verandah along most of the south wall. A monolithic-clad “chimney” structure rises through the roof on the east wall.

2.3 An enclosed deck from bedroom 2 is recessed into the roof slope above the garage, with the roof edges forming the barrier. A second enclosed deck extends from bedroom 1, with most of the deck area situated above living areas below. The latter is recessed beneath the roof overhang, and the remaining cantilevered section has framed balustrades clad with timber weatherboards on the outer face and monolithic cladding on the inner face.

2.4 The expert noted that the framing to the deck balustrade appeared to be Douglas fir, and that the owner had advised that the battens and packers to the lower timber floor were treated to H4 standard. The specification calls for wall framing to comply with

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

NZS 3602, which at the time of construction would permit untreated timber. Based on this evidence, I consider that, with the exception of the packers, the external wall framing is unlikely to be treated.

- 2.5 The majority of the wall cladding is a monolithic cladding system described as stucco over a solid backing. In this instance it consists of 4.5 mm “Hardibacker” sheets fixed through the building wrap directly to the framing timbers, and covered by a slip layer of building wrap, metal-reinforced 20 mm thick solid plaster and a flexible paint coating. Several upper wall areas, and a small panel to the lower east wall are clad in rough-sawn timber bevel backed weatherboards, which are fixed through the building wrap directly to the framing. The north wall to the garage is clad with 7.5mm fibre-cement sheets, with butt joints and a painted finish.

### **3 Sequence of events**

- 3.1 The territorial authority issued a building consent number 960377 on 2 April 1996, and carried out various inspections during construction. No inspections appear to have been carried out following a pre-line inspection on 7 October 1996. The house appears to have been completed and occupied during 1996.
- 3.2 In a letter to the applicant dated 14 May 2002, the territorial authority acknowledged receipt of amendments to the consent drawings, but required several matters to be addressed before the changes would be reconsidered.
- 3.3 In response to a request for a code compliance certificate, the territorial authority carried out a final inspection on 30 August 2006, which identified a number of defects and outstanding documentation.
- 3.4 In a letter to the applicants dated 13 December 2006, the territorial authority noted that items identified during the final inspection required rectifying and that the inspection had revealed some elevated moisture levels. The territorial authority also explained that durability requirements commenced from the date of issue of the code compliance certificate and stated that a code compliance certificate could not be issued for the house, noting:
- As it is now approximately ten years since construction commenced it would not be appropriate for this period to be added to the durability time frames identified in the New Zealand Building Code. Nelson City Council therefore 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.
- 3.5 The Department received an application for a determination on 7 February 2007.

### **4 The submissions**

- 4.1 The applicant forwarded copies of:
- the consent drawings and specification
  - the amended drawings

- some of the building consent documentation
- some inspection records
- correspondence from the territorial authority
- various producer statements, engineering calculations and other statements.

4.2 The territorial authority made no submission.

4.3 Copies of the applicant's submission and other evidence were provided to the territorial authority, which made no submission in response.

4.4 A copy of the draft determination was sent to the parties on 16 April 2007. The draft was issued for comment and for the parties to agree a date when the building elements, other than the matters to be rectified, complied with Building Code Clause B2 Durability.

4.5 The applicant responded to the draft in a letter to the Department dated 29 April 2007. The applicant said that fixing many of the defects found by the expert would not present a problem. The applicant also sought advice about how to fix other specific defects. Detailed questions of this nature are best left for discussion with the territorial authority as it is the territorial authority that will need to be satisfied that the defective items are made code compliant.

4.6 The territorial authority responded to the draft in a fax to the Department dated 6 June 2007.

4.7 Both parties proposed that 1 January 1997 should be the date when all the building elements installed in the house, apart from the items that have to be rectified, complied with the durability provisions of the building code.

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

5.1 As discussed in paragraph 1.4, 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.

5.2 The expert inspected the house on 9, 13 and 14 March 2007, and furnished a report that was completed on 14 March 2007. The expert noted that the workmanship was generally of good quality, with "well-considered flashings". The expert noted that adequate back flashings were installed at the junctions between the two claddings.

5.3 The expert noted that the building work generally conformed to the consent drawings, except for:

- The replacement of a large door opening to the rear wall of the garage with a weatherboard-clad panel.
- The addition of a deck from bedroom 2.
- The change in the balustrade cladding to the deck from bedroom 1.

- 5.4 The expert noted hairline cracks in the stucco (in line with window jambs), which indicated that control joints were installed to walls where dimensions exceed the 4m length limit recommended in NZS 4251, the Code of Practice for solid plastering.
- 5.5 The expert inspected the windows in both claddings to observe installation details.
- 5.5.1 The expert noted that the timber windows in the stucco cladding were recessed, with hidden metal head, jamb and sill flashings. The expert removed a small section of plaster at the jamb to sill junction of a window and noted that the flashings appeared satisfactory, with the bottom of the jamb flashing crimped into a channel to direct moisture to the sill flashing below the timber sill.
- 5.5.2 The expert noted that the timber windows within the weatherboards were bordered by timber facings, with metal head flashings above the top facing and jamb flashings (which overlapped sill flashings) under the side facings. Timber scribes covered the junctions between the side facings and the weatherboards.
- 5.6 The expert inspected the interior of the house and no evidence of moisture was noted. The expert took non-invasive moisture readings internally around the house and no significant variation in readings, indicative of localised moisture entry, was recorded. The expert took invasive moisture readings through the cladding at 10 risky areas, and the following readings were noted:
- 18% at the base of the chimney framing
  - 18% in the deck balustrade framing
  - 19% in the bottom packer to the west wall
  - 20% at the base of the north staircase wall
  - 22% in the bottom plate of the east wall
  - 23% in the bottom plate of the south wall

Significant variations in moisture levels measured at various points in a building after the cladding is in place generally indicate that external moisture is entering the structure and further investigation is required. In the case of this house the variations in moisture measurements were not significant in themselves, but did tend to corroborate concerns that the high ground levels around the house were causing moisture transfer to the wall framing.

- 5.7 Commenting specifically on the cladding, the expert noted that:

**External moisture**

- there are inadequate clearances from the bottom of the stucco to the ground or paving around all walls
- some pipe and cable penetrations through the stucco are inadequately sealed
- there are isolated cracks in the stucco cladding
- the apron flashings lack kickouts, and the gutters butt against the adjoining stucco cladding

- the scribes at doors and windows in the weatherboard cladding are poorly fitted and sealed (with gaps showing)
- the deck to Bedroom 1 lacks an overflow pipe, and the mitres to the timber capping of the clad balustrade are poorly weatherproofed (with gaps showing)
- the drainage and overflow outlets in the deck to Bedroom 2 are poorly weatherproofed and heavily reliant on sealant
- the area of painted fibre-cement cladding on the north garage wall has butted vertical and horizontal joints, and incorporates sheets with recessed edges (intended for a flush finish)

### **Other issues**

- The gully trap on the east wall is set too low which could result in the ingress of some surface water.

5.8 A copy of the expert's report was provided to each of the parties on 6 March 2007.

## **6 Evaluation for code compliance**

### **6.1 Evaluation framework: exterior cladding**

6.1.1 In evaluating the design of a building and its construction, it is useful to make some comparisons with the relevant Acceptable Solutions<sup>4</sup>, which will assist in determining whether the features of these houses are code compliant. However, in making this comparison, the following general observations are valid:

- Some Acceptable Solutions cover the worst case, so that they may be modified in less extreme cases and the resulting alternative solution will still comply with the Building Code.
- Usually, when there is non-compliance with one provision of an Acceptable Solution, it will be necessary to add some other provision to compensate for that in order to comply with the Building Code.

6.1.2 The approach 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<sup>5</sup> (for example, Determination 2004/1) relating to cladding and these factors are also used in the evaluation process.

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<sup>4</sup> An Acceptable Solution is a prescriptive design solution approved by the Department that provides one way of complying with the Building Code. The Acceptable Solutions are available from The Department's Website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

<sup>5</sup> Copies of all determinations issued by the Department can be obtained from the Department's website.

6.1.3 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.

## **6.2 Weathertightness risk**

6.2.1 In relation to these characteristics I find that this house:

- is built in a medium wind zone
- is a maximum of two storeys high
- is fairly simple in plan, but has a complex roof form
- has solid plaster and weatherboard claddings fixed directly to the framing
- has no eaves or verge projections
- has two enclosed decks, situated over living areas
- has external wall framing that is not treated to a level that provides resistance to the onset of decay if the framing absorbs and retains moisture.

6.2.2 The house has been evaluated using the E2/AS1 risk matrix. The risk matrix allows the summing of a range of design and location factors applying to a specific building design. The resulting risk rating can range from 'low' to 'very high'. The risk rating is applied to determine what claddings can be used on a building in order to comply with E2/AS1. Higher levels of risk will require more rigorous weatherproof detailing; for example, a high risk level is likely to require particular types of cladding to be installed over a drained cavity.

6.2.3 When evaluated using the E2/AS1 risk matrix, the weathertightness features outlined in paragraph 6.2.1 show that all elevations of this house demonstrate a moderate weathertightness risk rating. I note that, in order to comply with E2/AS1, the monolithic cladding of this building would require a drained cavity while the weatherboard cladding would not require a drained cavity.

## **6.3 Weathertightness performance:**

6.3.1 Generally the cladding appears to have been installed in accordance with good trade practice. However, I accept the expert's opinion that remedial work is necessary in respect of the following:

- The inadequate cladding clearances.
- The inadequately sealed pipe and cable penetrations.
- The cracks in the stucco cladding.
- The lack of kickouts to the apron flashings and the lack of gaps at gutter ends.

- The inadequately fitted and sealed scribes to windows and doors in the weatherboards cladding.
- The lack of an overflow pipe to the bedroom 1 deck.
- The inadequate weatherproofing of mitres in the timber capping to the balustrade of the bedroom 1 deck.
- The inadequate weatherproofing of the drain and overflow outlets to the bedroom 2 deck.
- The inadequately finished joints to the fibre-cement cladding to the north wall.

6.4 Notwithstanding the fact that the stucco is fixed directly to the timber framing, thus limiting drainage and ventilation behind the cladding, I have noted certain compensating factors that assist the performance of the cladding in this particular case:

- Apart from the noted exceptions, the stucco is installed to good trade practice.
- The flashings to windows, doors and junctions with the weatherboard cladding appear to be satisfactorily installed and effective in preventing moisture penetration at those junctions.

6.5 I consider that these factors help compensate for the lack of a drained cavity to the stucco walls, and can assist the building work to comply with the weathertightness and durability provisions of the Building Code.

## **6.6 Compliance with other code clauses**

6.6.1 In order for the house to comply with other requirements of the Building Code, I accept the expert's opinion that remedial work is necessary in respect of the inadequate clearance from the top of the gully trap to the paving on the east wall.

6.6.2 I note that the acceptable solution for this matter is described in paragraph 3.3.1 of G13/AS2.

6.7 I also note the expert's comments in paragraph 5.3 regarding changes to the consent drawings. I note that the territorial authority has acknowledged receipt of amended drawings (refer paragraph 3.2), but I have seen no evidence that the amendments have been approved.

## **Matter 1: The cladding**

### **7 Discussion**

7.1 I consider the expert's report establishes that the current performance of the cladding is not adequate because it is allowing some water penetration into the building at present. Consequently, I am satisfied that the building does not comply with clause E2 of the Building Code.

- 7.2 In addition, the building 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 cladding faults on the building are likely to continue to allow the ingress of moisture in the future, the house does not comply with the durability requirements of clause B2.
- 7.3 Because the faults identified with the cladding system occur in discrete areas, I am able to conclude that satisfactory rectification of the items outlined in paragraphs 6.3.1 and 6.6.1 will result in the building remaining weathertight and in compliance with clause B2, and being brought into compliance with other clauses of the Building Code.
- 7.4 I emphasise that each determination is conducted on a case-by-case basis. Accordingly, the fact that particular cladding systems have been established as being code compliant in relation to a particular building does not necessarily mean that the same cladding systems will be code compliant in another situation.
- 7.5 Effective maintenance of claddings (in particular of monolithic claddings) is important to ensure ongoing compliance with clauses B2 and E2 of the Building Code and is the responsibility of the building owner. Clause B2.3.1 of the Building Code requires that the cladding be subject to “normal maintenance”, however that term is not defined in the Act.
- 7.6 I take the view that normal maintenance is that work generally recognised as necessary to achieve the expected durability for a given building element. With respect to the cladding, the extent and nature of the maintenance will depend on the material, or system, its geographical location and level of exposure. Following regular inspection, normal maintenance tasks should include but not be limited to:
- where applicable, following manufacturers’ maintenance recommendations
  - washing down surfaces, particularly those subject to wind-driven salt spray
  - re-coating protective finishes
  - replacing sealant, seals and gaskets in joints.
- 7.7 As the external wall framing of this house may not be treated to a level that will resist the onset of decay if it gets wet, periodic checking of its moisture content should also be carried out as part of normal maintenance.

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

### **8 Discussion**

- 8.1 The territorial authority has concerns about the durability, and hence the compliance with the building code, of certain elements of the building taking into consideration

the completion of most of the building work by the end of 1996. (However I note that I have received no copies of inspection records to verify compliance with clause B2 in 1996.)

8.2 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 (“durability periods”) “from the time of issue of the applicable code compliance certificate” (clause B2.3.1).

8.3 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.

8.4 It is not disputed, and I am therefore satisfied that all the building elements installed in the house, apart from items that have to be rectified as described in paragraphs 6.3.1 and 6.6.1, complied with clause B2 on 1 January 1997. This date has been confirmed by the applicant and the territorial authority, refer paragraph 4.7.

8.5 In order to address these durability issues, I sought some clarification of general legal advice about waivers and modifications. I have now received that clarification and the legal framework and procedures based on this clarification are described in previous determinations (for example, Determination 2006/85) and are used to evaluate the durability issues raised in this determination.

8.6 I continue to hold that view, and therefore conclude that:

- (a) the territorial authority has the power to grant an appropriate modification of clause B2 in respect of the building elements
- (b) 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 for the house had been issued in 1997.

8.7 I strongly recommend that the territorial authority record this determination and any modifications resulting from it, on the property file and also on any LIM issued concerning this property.

## 9 The decision

- 9.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the cladding does not comply with clauses E2 and B2 of the Building Code, and accordingly confirm the territorial 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 building, apart from the items that are to be rectified, complied with clause B2 on 1 January 1997.
  - (b) the territorial authority shall modify the building consent 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 January 1997 instead of from the time of issue of the code compliance certificate for all building elements provided that this modification does not apply to the elements that have been altered or modified as set out in paragraphs 6.3.1 and 6.6.1 of Determination 2007/63.
  - (c) following the modification set out in (b) above, the territorial authority is to issue a code compliance certificate in respect of the building consent as amended.
- 9.3 I note that the territorial authority has not issued a notice to fix. A notice to fix should be issued that requires the applicant to bring the building into compliance with the Building Code, identifying the defects listed in paragraphs 6.3.1 and 6.6.1, including any defects associated with this work discovered in the course of rectification. The notice to fix should not specify how the defects are to be fixed as that is a matter for the applicant to propose and for the territorial authority to accept or reject. It is important to note that the Building Code allows for more than one method of achieving compliance.
- 9.4 I would suggest that the parties adopt the following process to meet the requirements of paragraph 9.3. Initially, the territorial authority should issue the new notice to fix. The owner should then produce a response to this in the form of a detailed proposal, produced in conjunction with a competent and suitably qualified person, as to the rectification or otherwise of the specified issues. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 13 June 2007.

John Gardiner  
**Manager Determinations**