

## Determination 2007/58

### Determination regarding a code compliance certificate for a house at 5 Avalon Place, 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 P Miller (“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 an 11-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).

<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 remaining code clauses**

The building complies with the remaining clauses of the Building Code.

**1.3.3 Matter 3: 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 single-storey detached house, with a basement garage, situated on a steeply sloping excavated site, which is in a high wind zone for the purposes of NZS 3604<sup>3</sup>. The part basement of the house is specifically engineered, with concrete slabs and foundations, pre-cast concrete walls and retaining walls, steel portal frames and beams, and timber framing. The floor-to-ceiling height of the garage area is more than 4m, with a timber-framed mezzanine over part of the area.

2.2 The remainder of the house is conventional light timber frame construction, with concrete slabs and foundations, a small area of timber-framed subfloor, monolithic cladding and aluminium windows. The house is fairly simple in plan and form, with a 20° pitch profiled metal hipped roof and eaves projections of more than 600mm above most walls. A hipped lean-to roof extends to the northeast above a small part of the garage.

2.3 An attached timber-framed deck, with spaced timber slats and open balustrades, extends from the upper northwest wall. A similar smaller timber deck extends along part of the southeast wall at the main entrance. Several timber retaining walls accommodate the site slope at the east corner and behind the southwest wall.

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

- 2.4 The specification calls for the wall framing to be Douglas Fir, and the expert has confirmed this. Based on this evidence and the date of construction, I accept that the wall framing is likely to be untreated.
- 2.5 The cladding is a monolithic cladding system described as stucco. In this instance it consists of building wrap fixed directly to the framing timbers and covered with metal mesh-reinforced 20mm thick solid plaster, and a flexible paint coating.

### **3 Sequence of events**

- 3.1 The territorial authority issued a building consent number 951120 (which I have not seen) on 12 January 1996, and carried out plumbing and drainage inspections during construction. Structural inspections were undertaken by the structural engineer (“the engineer”) but I have received no evidence of other inspections, and it appears that no final inspection was carried out. The house appears to have been completed and occupied during 1996.
- 3.2 In response to a request for a code compliance certificate, the territorial authority wrote to the applicant on 9 January 2007, explaining that durability requirements of the code commenced from the date of issue of the code compliance certificate. The territorial authority stated that a code compliance certificate could not be issued for the house, noting:
- As it is now approximately eleven 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.
- 3.3 The Department received an application for a determination on 10 January 2007.

### **4 The submissions**

- 4.1 The applicant forwarded copies of:
- the drawings and specification
  - some of the building consent documentation
  - some inspection records
  - 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 a draft determination was forwarded to the parties on 23 March 2007. The draft was issued for comment and for the parties to agree a date when the building

elements installed in the house complied with the Building Code Clause B2 Durability.

- 4.5 Both parties accepted the draft determination and agreed that compliance with B2 Durability was achieved on 31 March 1996.

## 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 initially inspected the house on 23 and 27 February 2007, and furnished a report that was completed on 28 February 2007. The expert noted that “generally the workmanship is of average quality”, and also noted that the “stucco appears to be in sound condition”.
- 5.3 The expert noted that the building work generally conformed to the consent drawings, except that:
- the projecting corner bay window to the dining room was not constructed
  - two decks have been added
  - a mezzanine floor has been installed within the garage area.
- 5.4 The expert was not able to tell whether vertical control joints had been installed in the four walls where dimensions exceed the 4m length limit recommended in NZS 4251, the Code of Practice for solid plastering. However, the expert also noted that there was no evidence of damage to the plaster resulting from undue movement during the 11 years since construction.
- 5.5 The expert noted that the windows had been face-fixed with no sill or jamb flashings – with sealant used when window heads were beneath deep soffits and metal head flashings used elsewhere. The expert removed a small section of plaster at the jamb to sill junction of a window, and noted that the plaster extended behind the window flange at the jambs and sill.
- 5.6 The expert inspected the interior of the house and no evidence of moisture was noted. The expert took non-invasive moisture readings through the linings of exterior walls, and no elevated moisture readings were recorded. The expert also took invasive moisture readings through the cladding at 6 areas of potential risk, and all moisture readings were 14% or lower.
- 5.7 The expert made the following specific comments on the cladding:

### External moisture

- There is inadequate clearance from the bottom of the cladding to the ground along the southwest wall.

- The sealant at window heads under soffits is inadequate in some areas, and is missing at the main entry door head.
- A pipe through the concrete wall is unsealed, and exterior light fittings are poorly sealed.
- There is a panel of texture-coated fibre-cement above the garage door, with a crack at the joint between the backing sheets.
- There is fibre-cement sheet lining above the precast concrete panels at the rear of the garage, and the back of this is unpainted and exposed to the subfloor area.
- The subfloor ground level is above the retaining wall tanking in some areas.
- The apron flashings lack kickouts at two locations, and the gutters butt against the adjoining cladding.
- The timber slats to the decks lack drainage gaps at the junction with the wall, and the plaster covers the timber in some areas. Where the deck adjoins timber framing, the deck stringers are fixed directly to the cladding.
- The entry door panel has no flashing at the sill, and bare timber and insulation is visible.

### **Other issues**

- A waste pipe in the subfloor area lacks a pipe hanger.
- In the subfloor area, a section of the foundation is not founded on the ground and a bearer is supported from a post that is inadequately fixed to the concrete wall.
- The structure of the timber decks appears inadequate.
- The steps to the deck lack a handrail.
- The retaining wall to the southwest is more than 1m high and lacks a balustrade.
- The deck balustrade is only 940mm high.
- The internal stairs lack a handrail.
- The hot water cylinder lacks a tempering valve.
- Insufficient smoke detectors have been provided.
- The shower in the ensuite bathroom is inadequately enclosed to prevent water splash, and the vanity is unsealed at the junction with the wall.

- 5.8 The expert also noted that the fibre-cement panel above the garage door is only 4.5mm thick, in lieu of the 6mm thick sheet recommended by the manufacturer.
- 5.9 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>, in this case E2/AS1, 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.
- 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 high wind zone
  - is a maximum of two storeys high
  - is fairly simple in plan and form

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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.

- has solid plaster cladding that is fixed directly to the framing
- has eaves projections of more than 600mm above most walls
- has attached timber slat decks with open balustrades
- has external wall framing that will provide limited resistance to decay if it absorbs and retains moisture.

6.2.2 When evaluated using the E2/AS1 risk matrix, these weathertightness features show that all elevations of this house demonstrate a low weathertightness risk rating. The matrix is an assessment tool that is intended to be used at the time of application for consent, before the building work has begun and, consequently, before any assessment of the quality of the building work can be made. Poorly executed building work introduces a risk that cannot be taken into account in the consent stage but must be taken into account when the building as actually built is assessed for the purposes of issuing a code compliance certificate.

### 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 recommendation that remedial work is necessary in respect of the following:

- The inadequate cladding clearance along the southwest wall.
- Some unsealed or inadequately sealed door and window heads under soffits.
- The inadequately sealed pipe and cable penetrations.
- The crack in the fibre-cement panel above the garage door.
- The lack of sealing to the backs of fibre-cement sheets in the subfloor.
- The ground level above the top of the tanking in the subfloor.
- The lack of apron flashings and the lack of a gap at the gutter ends.
- The lack of a drainage gap between the wall cladding and the timber deck slats and inadequate weatherproofing of the deck to wall junctions in some areas.
- The lack of adequate weatherproofing to the entry door sill.

6.3.2 I note the expert's comment in paragraph 5.8, but consider that the 4.5mm thick fibre cement panel above the garage door is acceptable in this situation, as the panel is not prone to damage, is reasonably well sheltered beneath the eaves and is not lined or insulated on the garage side.

6.3.3 I also note the expert's comment in paragraph 5.4 regarding the lack of vertical control joints. However, the stucco cladding appears to have generally been installed according to good trade practice, and has been in place for more than 10 years with

no signs of movement, associated cracking or moisture entry. During the period since construction, all drying shrinkage in the concrete plaster and supporting framing will have likely occurred, and the cladding's future performance will be governed solely by response to environmental factors such as imposed temperature and moisture effects, wind, earthquake forces and seasonal foundation movements. I therefore consider that the stucco plaster system as installed is adequate, without the retrofitting of the omitted control joints that were required in the general case by NZS 4251<sup>6</sup>.

6.3.4 Notwithstanding the fact that the cladding 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 claddings in this particular case:

- the cladding is installed to good trade practice
- the stucco plaster has been in place for more than 10 years, with no sign of moisture entry
- the house generally has roof projections that provide good protection to the cladding areas below them.

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

## **6.4 Other compliance matters**

6.4.1 I also accept the expert's recommendation that remedial work is necessary in respect of the following:

- The lack of adequate support for the waste pipe in the subfloor.
- The inadequate foundation and bearer supports in the subfloor.
- The inadequate structure of the timber decks.
- The lack of a handrail to the steps to the deck.
- The lack of a safety barrier to the top of the southwest retaining wall.
- The inadequate height of the deck balustrades.
- The lack of provision of tempered hot water to sanitary facilities.
- The lack of a handrail to the internal stairs.
- The inadequate provision for water splash at the ensuite shower and vanity.

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<sup>6</sup> New Zealand Standard NZS 4251: Solid plastering; Part 1: 1998 Cement plasters for walls, ceilings and soffits



- 6.4.2 I note that smoke detectors have not been installed. This was not a requirement of the Building Code at the time of construction, however, I recommend that they be installed in accordance with F7/AS1.

## Matter 1: The cladding

### 7 Discussion

- 7.1 I consider that the expert's report establishes there is no evidence of external moisture entering the building, and accordingly, that its cladding does comply with clause E2 at this time.
- 7.2 However, 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 additions to remain weathertight. Because the cladding faults on the building are likely to allow the ingress of moisture in the future, the house does not comply with the durability requirements of clause B2.
- 7.3 I emphasize 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.
- 7.4 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 paragraph 6.3.1 will result in the building remaining weathertight and in compliance with clause B2.
- 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 will provide only limited resistance to 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 remaining code clauses**

### **8 Discussion**

- 8.1 I draw the matters listed in paragraph 6.4.1 to the attention of the territorial authority for inclusion in the notice to fix.

## **Matter 3: The durability considerations**

### **9 Discussion**

- 9.1 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.)
- 9.2 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).
- 9.3 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.
- 9.4 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 6.4.1, complied with clause B2 on 31 March 1996. This date has been confirmed by the applicant and the territorial authority, refer paragraph 4.5.

- 9.5 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.
- 9.6 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 1996.
- 9.7 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 properties.

## 10 The decision

- 10.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the building does not currently comply with clauses B1, B2, D1, E3, F4, G12, and G13 of the Building Code, and accordingly confirm the territorial authority's decision to refuse to issue a code compliance certificate.
- 10.2 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 31 March 1996
  - (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 31 March 1996 instead of from the time of issue of the code compliance certificate for all building elements except those elements which have been altered or modified as set out in Determination 2007/58.
  - (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.
- 10.3 I note that the territorial authority has not issued a notice to fix. A notice to fix should be issued that requires the applicants to bring the building into compliance with the Building Code, identifying the defects listed in paragraph 6.3.1 and 6.4.1, including any associated defects discovered during the course of that work, but not specifying how those defects are to be fixed. That is a matter for the applicants 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.

- 10.4 I suggest that the parties adopt the following process to meet the requirements of paragraph 10.3. Initially, the territorial authority should issue a 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 31 May 2007.

John Gardiner  
**Manager Determinations**