

## Determination 2008/8

### Determination regarding code compliance for an 11-year-old house at 36 Headland Farm Park, Manganese Point Road, Parua Bay



#### 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 applicants are the owners B and A Hawkins (“the applicants”), acting through an agent, Westpark Design (“the designer”), and the other party is the Whangarei District 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 the building work complies with Clauses B2 and E2 of the Building Code<sup>2</sup> (First Schedule, Building Regulations 1992). In addition, the territorial authority has requested that this determination also consider other identified defects,

<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).

which have resulted in the territorial authority not being satisfied that the house complies with Clauses E1, E3 and F4 (refer paragraph 4.3). As that request appears to be in the applicants' interests, and as the applicants have not objected, I have agreed to it.

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 Building Code Clause B2 "Durability", taking into account the age of the building work.

**1.3.3 Matter 3: The other code considerations**

The elements identified in the final inspection comply with Clauses E1, E3 and F4.

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 matter ("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 I note that no code compliance certificates have been issued for any stages of the building work carried out since 1995 (as described in paragraph 2.4). This determination only considers those aspects of code compliance that have been brought to its attention by the parties and by the expert, such as the solid plaster cladding, which I also note was unconsented work. I make no decision as to how the unconsented work is to be dealt with either through the issue of a certificate of acceptance or by means of an amendment to the current building consent(s).

1.6 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 large detached house situated on a west sloping site, which is in a high wind zone for the purposes of NZS 3604<sup>3</sup>. Most of the house is two storeys high, reducing to one storey on part of the south and east elevations. Construction is conventional light timber frame, with concrete slabs, concrete block foundations and walls to the basement, timber-framed subfloor to the single storey areas, aluminium windows and monolithic wall cladding. The house shape is moderately complex in plan and form, with a 20° pitch trough section metal roof that

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

has “dutch gables” to three elevations and eaves projections of about 600mm wide overall.

2.2 Two enclosed decks, with tiled floors and glass and metal balustrades, extend from the upper level. The west deck sits partly above occupied areas below, while the front north deck provides a carport space below and has a monolithic-clad balustrade to one side.

2.3 A free-standing garage is linked to the main entry of the house with a canopy. (I have received no information about the garage building, which does not form part of this determination).

2.4 The building work considered in this determination involves the following phases:

#### **2.4.1 The original house**

The original house appears to have been erected early in 1995, as a simple single-storey pre-fabricated building by Keith Hay Homes Ltd. The consent drawings are standard plans that do not specify the type of cladding, although judging from subsequent correspondence and drawings, the cladding was fibre-cement weatherboards and roof was corrugated steel.

#### **2.4.2 The 1996 alterations and extensions**

The first extensions to the house appear to have been built immediately following the completion of the original house in 1995, and involved the addition of a 2-storey garage wing towards the northeast, an additional upper level master bedroom and bathroom and the development of other basement accommodation. The consent drawings show the wall claddings as fibre-cement weatherboards to the upper level and fibre-cement sheet to the subfloor, with concrete block basement walls.

#### **2.4.3 The subsequent alterations and extensions**

The house has been further extended and altered since 1996, and all of this work appears to have been carried out without a building consent. The changes include:

- internal alterations including rearrangement of internal stairs, new bathrooms and modifications to an existing bathroom, expansion into the existing basement area, and conversion of the basement garage area into a large office
- the addition of a new deck and extension of an existing deck
- installation of additional windows
- installation of solid plaster cladding over the existing cladding.

#### **2.4.4 2007 building consent application (No. 99648)**

It appears that a separate consent application has been made for “new deck post and stormwater disposal system”. I have not seen a copy of the application.

2.5 The expert noted no evidence as to timber treatment, and I have received no evidence as to the treatment, if any, of the external wall framing timber. Given the date of construction of the house and its subsequent extensions, I consider that none of the external wall framing is likely to be treated.

- 2.6 The cladding is a monolithic cladding system described as solid plaster over a solid backing. In this instance, the plaster appears to be applied over the original fibre-cement weatherboards and the fibre-cement subfloor sheets, both of which are fixed through the building wrap directly to the framing timbers. The stucco plaster appears to be reinforced with metal mesh, and the plaster extends down over the original concrete block walls.

### 3. Background

- 3.1 Based on the stamp on the original house drawings, the territorial authority issued a building consent for the work on 10 January 1995 (refer paragraph 2.4.1). I have no records of any inspections carried out, and it appears that no code compliance certificate was issued.
- 3.2 It appears that the territorial authority received an application for “Proposed Additions and Alterations” to the house on 31 March 1995, and issued a building consent (No. 10798), which I have not seen. It seems that the building work (as outlined in paragraph 2.4.2) was carried out before May 1996, based on the territorial authority’s stamp on an amended drawing which noted “Received 13 May 1996”. I have no records of any inspections carried out during construction.
- 3.3 Sometime between 1996 and 2006, the exterior was plastered and various other alterations and additions were made to the house, as outlined in paragraph 2.4.3. It appears that no building consent was issued for any of those changes.
- 3.4 In 2006, the applicants applied for a code compliance certificate and the territorial authority carried out a final inspection of the house on 24 November 2006. The inspection record identified defects and outstanding documentation, including the requirement to produce amended as-built drawings to reflect all of the changes, and the need to apply for an amendment to the consent to cover these. A notice to fix dated 24 November 2006 (which I have not seen) was issued at this time.
- 3.5 The applicants subsequently commissioned the designer to inspect the house. In a letter to the applicants dated 7 February 2007, the designer listed 16 items that required attention. In March 2007, the designer submitted as-built drawings to the territorial authority, together with an application for building consent for the deck posts and stormwater disposal system.
- 3.6 The territorial authority responded to the consent application in a letter to the designer dated 10 May 2007, stating that it was unable to issue a code compliance certificate for the existing house and noting:
- I have to advise we are suspending the above consent application as we feel it is only dealing with a minor part of a much larger problem; this being cladding issues etc. in relation to ground levels, un-consented works relating to original dwelling and Monolithic Cladding undertaken to addition without approved amendments.
- 3.7 The territorial authority attached a notice to fix, also dated 10 May 2007, which listed the following particulars of contravention or non-compliance:
1. Non-compliance with B1, E1, E2, E3, F4 specifically:

- Ground levels
  - Stucco plaster cracked
  - Internal shower leaking
  - Handrails to be completed and made rigid
2. Contravention of Section 40 Building Act 2004
- Cladding completed without consent
  - Cladding changed without amendment
  - Designation of parts of base altered (e.g. garage changed to habitable room) and items noted on Field Advice Notice 7605CC.

(I note that the notice to fix refers to alleged breaches of section 40 of the Building Act. The determination does not preclude the territorial authority from taking whatever action it deems necessary in respect of those breaches.)

3.8 The Department received an application for a determination on 22 June 2007.

## 4. The submissions

4.1 In a letter to the Department dated 18 June 2007, the designer described the general history and construction of the house, noting that the only matter to be determined was the cladding as all other matters would be attended to. The designer noted:

The building consent application for the 1995 additions shows Hardies weatherboard to the first floor addition but the clients advise us that the cladding was Hardies Hardibacker to accept the plaster finish. We are unable to confirm this as there were no amendments to the Consent for the new cladding.

We therefore require a Determination on the ability of the existing cladding to meet Building Code requirements and appropriate remedial work if required.

4.2 The applicants forwarded copies of:

- the consent drawings of the original house
- the consent drawings of the 1996 extended house
- the March 2007 as-built plans and new drainage layout documents
- the final inspection record (Field Advice Notice 7605CC)
- documents in support of building consent application No. 99648
- the letter and notice to fix dated 10 May 2007 from the territorial authority
- various photographs.

4.3 The territorial authority made a submission in the form of a letter to the Department dated 21 June 2007, noting that the most recent consent application was for drainage only (however, the application appears to include a “new deck post”). The territorial authority asked for the determination to include the other code issues covered in the notice to fix dated 10 May 2007 (refer paragraph 3.7, item 1). I note that this does not include the work allegedly undertaken without consent in contravention of section 40 of the Act (refer paragraph 3.7, item 2).

- 4.4 The draft determination was sent to the parties for comment on 28 August 2007. The draft was issued for comment and for the parties to agree a date with the building elements in the 1996 alterations complied with Building Code Clause B2 Durability.
- 4.5 The parties accepted the draft and accepted that compliance with Clause B2 was achieved in August 1996. I have therefore taken this date to be 1 August 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 inspected the house on 19 July 2007, and furnished a report that was completed on 20 July 2007. The expert noted that the cladding was “poorly finished” and uneven over the different substrates, with extensive cracking and blistering apparent, although some repair work had been recently undertaken. However, the expert noted that only some items identified in the territorial authority’s inspection had been attended to.
- 5.3 The expert noted that the windows were face-fixed, with metal head flashings and no visible jamb or sill flashings. Some of the windows were originally installed under the consent in 1995, and the subsequent amendment in 1996, while other windows have been installed after 1996. In some areas, the plaster levels around the windows indicated that plaster was applied after the window installation, apparently over the original claddings.
- 5.4 The expert inspected the interior of the house and observed water stains, mould and swelling skirtings in various timber-framed basement areas. The expert took invasive moisture readings through the stucco at high risk locations, and the following elevated readings were noted:
- 56% at the bottom plate beside the north front door
  - 38% at the bottom plate of the north wall to the basement bathroom
  - 18% to 24% at the bottom plate of the west wall below the upper deck
  - 30% in the basement framing of the southwest corner
  - 48% at the bottom plate of the east wall of the upper level lounge
  - 54% below the window in the east wall of the basement office store
  - 22% in the north wall of the basement office below the upper deck.
- 5.5 Commenting specifically on the cladding, the expert noted that:
- there are no vertical or horizontal control joints (including between the different substrates), and some walls are above timber-framed foundations
  - the plaster has numerous cracks, blisters and damaged areas

- there is no, or insufficient, clearance from the bottom of the cladding to paving and garden areas (and a west downpipe is discharging against the paving)
- the windows lack sill or jamb flashings, and metal head flashings are embedded within the plaster with no allowance for drainage at heads
- there are no drainage gaps at the window sill flanges, and there are cracks in the plaster at the jamb flanges
- the canopy linking the garage with the house is poorly weatherproofed at the junction with the cladding, with cracks in the plaster apparent
- the satellite dish base and some flashings, wastepipes and downpipes are embedded into the plaster, which has apparently been applied later
- penetrations of pipes and fixings through the cladding are unsealed or poorly sealed
- the deck falls to both decks are inadequate, with ponding apparent
- there is no clearance from the bottom of the plaster to the deck tiles
- the west deck has inadequate clearance from the deck floor to the inside floor
- water stains in the walls below the west deck indicate that water is penetrating the deck and the deck to wall junctions
- the plastered balustrade to the side of the office deck has a flat top, no capping and a hole in the plaster at the fixing of the front balustrade.

5.6 The expert made the following comments in regard to the other defects noted in the final inspection, and included in the notice to fix:

- Spouting and downpipe repairs and connections to stormwater are not yet completed.
- The deck handrails are not yet fixed adequately and the side steps still lack a handrail.
- Although the shower door has safety glass, the ensuite window does not.
- The beam end fixing has not yet been remedied.

5.7 The expert also noted that, in regard to the notice to fix:

- the kitchen benchtops are now adequately sealed to the walls
- the apparent basement shower leak appears to be the result of a wall leak as indicated by the invasive moisture testing
- the rear deck leak is evident from the water stains and the moisture tests
- the insulation clearance to light fitting was not confirmed
- all other items in the inspection list are covered within the comments on the cladding in paragraph 5.5 (or are outstanding documentation).

5.8 A copy of the expert's report was provided to each of the parties on 26 July 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 the building work are code compliant. However, in making this comparison, the following general observations are valid:

- Some Acceptable Solutions are written conservatively to 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 one or more other provisions 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 moderately complex in plan and form
- has monolithic cladding applied over different substrates that are fixed directly to the framing
- has eaves projections of about 600mm above most walls
- has “dutch gables” to three of the roof gables
- has two upper level decks that have membrane floors and clad balustrades, with one deck situated partly above an enclosed basement area below

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<sup>4</sup> An Acceptable Solution is a prescriptive design solution approved by the Department that provides one way (but not the only 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 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 level of risk can range from 'low' to 'very high'. The risk level 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 a particular type of cladding to be installed over a drained cavity.
- 6.2.3 The weathertightness features outlined in paragraph 6.2.1 show that two elevations of this house demonstrate a high weathertightness risk rating and two elevations a low risk rating.

## **Matter 1: The cladding**

### **7. Discussion**

- 7.1 Taking into account the expert's report, I am satisfied that the current performance of the cladding installed on this house is inadequate because it has not been installed according to the requirements of NZS 4251, the Code of Practice for solid plastering and to good trade practice. In particular, the cladding is at present allowing significant moisture penetration into the walls through defects in the cladding, which in turn may have led to framing timber decay in some locations.
- 7.2 The cladding demonstrates the key defects listed in paragraph 5.5, and I have also identified the presence of a range of known weathertightness risk factors in this house. The presence of the risk factors on their own is not necessarily a concern, but they have to be considered in combination with the significant faults identified in the cladding system. It is that combination of risk factors and faults that indicate that the structure does not have sufficient provisions that would compensate for the lack of a drained and ventilated cavity. Consequently, I am not satisfied that the cladding system as installed complies with either Clause B2 or Clause E2 of the Building Code. I have given further consideration to the question of B2 compliance under Matter 2 of this determination.
- 7.3 I find that, because of the extent and complexity of the faults that have been identified in the cladding, I am unable to make a decision about how compliance might be achieved. I consider this can only be made after a more thorough investigation of the cladding, which will require careful analysis by an appropriately qualified expert. Once that analysis is completed, the chosen repair option (whether targeted repairs, re-cladding, or a combination of both) should be submitted to the territorial authority for its consideration and approval.

## 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 date of the original building in 1995 and of the first alterations in 1996. I have no evidence that the territorial authority carried out a final inspection in 1996 to verify compliance with Clause B2 at that time (refer paragraph 3.2).
- 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 The 11-year delay between the substantial completion of the building and the applicant’s request for a code compliance certificate raises the issue of when all the elements of the building complied with Clause B2. However, the building has undergone extensive alterations and additions, as noted in paragraphs 2.4.2 and 2.4.3, and it is unclear what building elements any modification of the durability periods should apply to.
- 8.5 I have not been provided with any evidence that the territorial authority did not accept that the building, after the completion of its first substantial alteration in 1996, did not comply with Clause B2 at that time. Therefore, I believe it is appropriate for any modification of the durability periods to apply to this work only, and not to any subsequent additions and extensions (which may, or may not, be the subject of either a code compliance certificate or a certificate of acceptance).
- 8.6 The parties have accepted this and have agreed that compliance with Clause B2, in respect of the 1996 alterations, occurred on 1 August 1996, refer paragraph 4.5.
- 8.7 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.

- 8.8 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 all the building elements
  - (b) it is reasonable to grant such a modification, with appropriate notification, because in practical terms the original building, and as altered in 1996, is no different from what it would have been if a code compliance certificate for the building had been issued in 1996.
- 8.9 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.

### **Matter 3: The other code considerations**

#### **9. Discussion**

- 9.1 Taking into account the expert's comments in paragraph 5.6, I am satisfied that the house does not comply with Clauses E1 and F4 of the Building Code.
- 9.2 I note the expert's comments in paragraph 5.7 with regard to the basement shower, and accept that the external moisture penetration is likely to be the cause of the apparent shower leak. I also note that the expert reports that the benchtop sealing has been completed. I am therefore satisfied that the house complies with Clause E3 of the Building Code.

#### **10. The decision**

- 10.1 In accordance with section 188 of the Act, I determine that the building does not comply with Clauses B2, E1, E2, and F4 of the Building Code.
- 10.2 I also determine that:
- (a) all the building elements installed in the original building, and as altered in 1996, but excluding any work carried out in subsequent alterations and items that are to be rectified as described in this determination, complied with Clause B2 on 1 August 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 1 August 1996 instead of from the time of issue of the code compliance certificate for all building elements in the original building, and as altered in 1996, but excluding any work carried out in subsequent alterations and any items that are to be rectified as set out in Determination 2008/8.
  - (c) the territorial authority, once the matters set out in paragraphs 5.5 and 5.6 have been rectified to its satisfaction, is to issue a code compliance certificate in respect of the building consent as amended.
- 10.3 I note that that the territorial authority has issued two notices to fix, refer paragraphs 3.4 and 3.7. The territorial authority should withdraw those notices and issue a new

notice to fix that requires the owners to bring the building up to compliance with the Building Code, incorporating the defects listed in paragraph 5.5 and paragraph 5.6, and referring to any further defects that might be discovered in the course of rectification, but not specifying how those defects are to be fixed. It is not for me to decide directly how the defects are to be remedied and the cladding brought to compliance with the Building Code. That is a matter for the owner to propose and for the territorial authority to accept or reject.

- 10.4 I would suggest that the parties adopt the following process to meet the requirements of paragraph 10.3. 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 1 February 2008.

John Gardiner  
**Manager Determinations**