

## Determination 2008/91

### Determination regarding the code compliance of 9-year-old alterations to a house at 14 Treholm Lane, Te Puna, RD2, Tauranga



#### 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 that Department. The applicant is the owner, M Bowker (“the applicant”), and the other party is the Western Bay of Plenty District Council (“the authority”) carrying out its duties and functions as a territorial authority or building consent authority
- 1.2 This determination arises from the decision of the authority to refuse to issue a code compliance certificate for 9-year-old alterations and additions (“the alterations”) because it is not satisfied that the building work complies with the Building Code<sup>2</sup> (Schedule 1, 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 Based on correspondence with the authority following the application (refer paragraph 3.4), I take the view that the matters for determination are:

**1.3.1 Matter 1: The cladding**

Whether the cladding as installed on the alterations (“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 coatings) as well as the way the components have been installed and work together. (I consider this matter in paragraph 7.)

**1.3.2 Matter 2: The remaining code requirements**

Whether the alterations comply with the remaining relevant clauses of the building code. (I consider this matter in paragraph 8.)

**1.3.3 Matter 3: The durability considerations**

Whether the elements that make up the alterations comply with Building Code Clause B2 Durability, taking into account the age of the building. (I consider this matter in paragraph 9.)

1.4 In making my decision, I have considered the submissions of the parties, the report of the 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 extensive alterations to a detached house situated on a flat rural site, which is in a high wind zone for the purposes of NZS 3604<sup>3</sup>. The original 2-bedroom house was built in the 1960’s, with light timber framing, perimeter concrete foundation walls, suspended timber floors, brick veneer wall claddings, timber windows and a hipped roof.

### **2.2 The alterations**

2.2.1 The alterations consist of major additions to all elevations, which have approximately doubled the size of the house. The building work included associated interior alterations, new deck areas, re-cladding or plastering of original exterior walls and new roof cladding over the whole house. The existing timber joinery has been retained or re-used, and the new windows and doors match the old.

2.2.2 The additions include a new wing to the east providing a master bedroom and ensuite, another wing to the southwest providing a new garage, laundry, office and games room, and a new bedroom to the south.

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

- 2.2.3 The additions are conventional timber frame construction, with a concrete slab to the garage, suspended timber floors elsewhere, monolithic wall cladding, timber windows and profiled metal roof cladding. The 12.5° pitch hipped and gabled roof has eaves projections of about 1000 mm, with verge projections of about 500mm to the four new gable end walls.
- 2.2.4 Three timber slat decks have been added at ground floor level, and these are partly sheltered beneath deep verandas. A raised concrete deck fills in the northwest corner recess between the lounge and the games room.
- 2.3 The wall cladding is a form of monolithic cladding that consists of 7.5 mm thick fibre-cement sheets fixed through the building wrap to the framing, and finished with an applied textured coating system.
- 2.4 The expert has noted that he was unable to confirm whether the wall framing is treated. Given the age of the original house, the original timber framing is likely to be boracic treated. However, given the requirements for treatment when the alterations were undertaken in 1999, I consider that the exterior wall framing of the alterations to this house is unlikely to be treated.

### **3. Background**

- 3.1 The authority issued a building consent for the alterations to the house (No. 61248) on 24 February 1999, and carried out various inspections during construction, including pre-line inspections on 27 April, 8 June and 12 July 1999. The latter appears to be the last inspection undertaken.
- 3.2 In a letter to the applicant dated 25 June 2008, the authority stated that the Act required that reasonable progress be made on building projects, noting:
- A prelining inspection was carried out in July 1999 but no inspections have been requested or carried out since then.
- Therefore reasonable progress has not been made in this case, and this is the reason why Council declines to issue the Code Compliance Certificate.
- 3.3 The Department received an application for a determination on 30 June 2008 and sought further information from the authority and applicant on the nature of the dispute.
- 3.4 Following a series of emails confirming that the building work was complete but there had been no formal request for a code compliance certificate, it was agreed that the determination would consider the matters of code compliance and the age of the building consent.

### **4. The submissions**

- 4.1 The applicant forwarded copies of:
- the drawings
  - the consent documentation

- the authority's inspection records
  - code of compliance certificate for the fireplace dated 26 April 2002
  - the letter from the authority dated 25 June 2008
  - various producer statements, certificates, and other information.
- 4.2 Copies of the applicant's submission and other evidence were provided to the authority, which did not respond.
- 4.3 A draft determination was issued to the parties on 28 August 2008. The draft was issued for comment and for the parties to agree a date when the house complied with Building Code Clause B2 Durability.
- 4.4 The parties accepted the draft without comment and agreed that compliance with Clause B2 was achieved on 30 August 1999.

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

- 5.1 As mentioned 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. The expert inspected the house on 27 July 2008 and supplied a report that was completed on 13 August 2008.
- 5.2 The expert noted that the house appeared to be generally in accordance with the amended consent drawings, except that:
- a shower has been added to the toilet area beside the laundry
  - the shower in the ensuite was tiled in lieu of an acrylic cubicle.
- 5.3 The expert described the house as generally well-maintained (except for the timber windows), with "good quality materials and good standard of workmanship".

### **5.4 The building envelope**

- 5.4.1 The expert noted that the cladding is "well fixed and aligned", with no evidence of "cracking/peaking or premature deterioration" and the standard of finish is generally very good. The expert also noted that the roof valley, hip and barge flashings appear to be appropriately fitted and in good condition.
- 5.4.2 The expert noted that the new and re-used timber windows and doors are installed in a traditional manner, with solid timber sills and timber facings at heads and jambs. Metal head flashings are installed over the top facing. The facings cover the window to wall junction, with a fillet of sealant applied at the edge of the facing and around the sills. The expert noted that windows installed below the eaves were sheltered by 1m roof overhang, but those installed at gable end walls are exposed to the weather.
- 5.4.3 The expert inspected the interior of the house, taking non-invasive moisture readings internally, and no evidence of moisture was observed. The expert took 8 invasive

moisture readings through the cladding, and the following elevated reading were noted:

- 19% and 20% in the bottom plates beside the garage doors (at a gable end)
- 22% and 23% beneath the games room west window sill (at a gable end)
- 23%, 38%, more than 40% and more than 50% in the bottom plate at the northwest walls of the lounge and games room (at the concrete deck)
- 36% beneath the master bedroom north window sill (at a gable end)
- 18% beneath a master bedroom east window sill.

I note that the invasive readings indicated that the equilibrium moisture content (“EMC”) ranged from about 13% to 16% at the time of inspection. Moisture levels that vary significantly from the EMC range generally indicate that external moisture is entering the structure and further investigation is required.

5.5 Commenting specifically on the cladding, the expert noted that:

- there is insufficient clearance from the cladding to the ground and paving at some areas beside the garage concrete slab
- the timber joinery is in need of repainting, with cracking and peeling paint
- the jamb facings and sills to windows and doors are sealed with only a fillet of sealant, and moisture is penetrating into the fibre-cement sheets and framing
- the concrete deck to the northwest butts against the cladding, with no clearance or allowance for drainage, and moisture is penetrating at the junction
- the vent pipe from a hot water cylinder penetrates the roof without a flashing, relying on sealant only for weathertightness.

5.6 The expert also noted that, although there are no vertical control joints on any of the external walls that exceed the manufacturer’s limit of 5.4m, there is no evidence of cracking or other deterioration as a result of their omission.

## 5.7 Compliance with the remaining code clauses

5.7.1 The expert also assessed compliance with other relevant Building Code clauses, and made the following comments on those clauses relevant to this house:

- **B1 Structure**

The expert inspected the sub-floor spaces and noted no evidence of dampness or other problems. The inspection record notes adequate inspections of the footings, and the internal and external visual inspection showed no signs of problems.

- **C1 Outbreak of fire**

The code compliance certificate for the open fireplace indicates that this meets the requirements. Although no problems were observed, the expert noted that there is no confirmation that the solid fuel heaters meet the requirements of AS/NZS 2918:2001.

- **E1 Surface water**

No problems were noted.

- **E3 Internal moisture**

The tanking to the ensuite shower could not be inspected, but there were no elevated moisture levels or signs of leaking detected. However, I note that no producer statement for the underlying membrane has been provided.

- **F2 Hazardous building materials**

Some glazing that requires safety glass cannot be verified, as there are no markings.

- **G1 Personal hygiene, G2 Laundering, G3 Food preparation**

All facilities appear to be in good working order, with adequate provision made to comply with the requirements.

- **G4 Ventilation**

Requirements for natural and mechanical ventilation are met, with extract fans satisfactorily vented to the outside.

- **G12 Water Supplies, G13 Foul Water, G14 Industrial Liquid Waste**

Water is supplied from the authority's mains supply, and an existing septic tank disposal system is used. The inspection records indicate that a satisfactory drainage inspection has been carried out. All fixtures appear to be in good operating condition and there is no evidence of leaks.

- **H1 Energy Efficiency**

The authority's inspection records indicate that satisfactory preline inspections were undertaken, and insulation is visible within the ceiling space.

5.8 Although not part of the consented building work and not part of this determination, the expert also noted that the swimming pool gate did not comply with the requirement of the Fencing and Swimming Pools Act 1987.

5.9 A copy of the expert's report was provided to the parties on 15 August 2008.

## 6. Evaluation for code compliance

### 6.1 Evaluation framework

6.1.1 I have evaluated the code compliance of this building by considering the following two broad categories of the building work:

- The weathertightness of the external building envelope (Clause E2) and durability (Clause B2 in so far as it relates to Clause E2).
- The remaining relevant code requirements.

In the case of this house, weathertightness considerations are addressed first.

6.1.2 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 this house are code compliant. However, in making this comparison, the following general observations are valid:

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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).

- 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.

## **Matter 1: The cladding**

### **7. Weathertightness**

7.1 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.

7.2 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.

#### **7.3 Weathertightness risk**

7.3.1 In relation to these characteristics I find that the alterations to this house:

- are built in a high wind zone
- result in a fairly complex single-storey building
- have monolithic cladding fixed directly to the wall framing
- have eaves projections of at least 1000 mm and verge projections of 500 mm
- have 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.

7.3.2 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.

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

7.3.3 When evaluated using the E2/AS1 risk matrix, the weathertightness features outlined in paragraph 7.3.1 show that all elevations of the house demonstrate a low weathertightness risk rating. I note that, in order to comply with the current issue of E2/AS1, the monolithic cladding of this building would not require a drained cavity.

## 7.4 Weathertightness performance

7.4.1 Generally the roof and wall claddings appear to have been installed in accordance with reasonable trade practice, but some areas have not been satisfactorily completed as outlined in paragraph 5.5. Taking account of the expert's report, I conclude that remedial work is necessary in respect of the following:

- The inadequate cladding clearance from the ground at the garage concrete slab.
- The deteriorating paint coating to the timber windows and doors.
- The lack of adequate seals behind the timber jamb facings to windows and doors, and the inadequate sealing of the timber sills.
- The moisture penetration associated with the windows also indicates that the backing sheets behind the timber facings are likely to be uncoated and will allow moisture that penetrates behind the facing to soak into the fibre-cement.
- The lack of clearance or allowance for drainage at the junction of the concrete deck with the cladding, with severe moisture penetration apparent.
- The inadequate weatherproofing of the roof penetration of the vent pipe from a hot water cylinder.

7.4.2 I note the high moisture readings in paragraph 5.4.3 and consider that further investigation is necessary to determine the condition of the timber framing to these areas.

7.4.3 I note the expert's comment in paragraph 5.6 regarding the lack of vertical control joints in walls exceeding 5.4 metres in length. I also note that the cladding has generally been installed according to good trade practice, and has been in place for 9 years with no signs of cracking.

7.4.4 During the period since construction, all drying shrinkage in the 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 retrofitting control joints will not be necessary in this particular case.

## 7.5 Weathertightness: conclusion

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

7.5.2 In addition, the building work 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 alterations are likely to allow the ingress of moisture in the future, the building work does not comply with the durability requirements of Clause B2.

7.5.3 Because the faults identified with the cladding system occur in discrete areas, I am able to conclude that satisfactory investigation and rectification of the items outlined in paragraph 7.4.1 will result in the house being brought into compliance with Clauses B2 and E2.

7.5.4 I note that the windows are in need of maintenance. 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 applicant. 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).

## **Matter 2: Compliance with the remaining code clauses**

### **8. Evaluation for code compliance**

#### **8.1 Other code requirements**

8.1.1 Taking account of the expert's report and comments as outlined in paragraph 5.7.1, I consider that the following items require documentation in order to verify:

- the safety and compliance of the solid fuel heater
- the installation of a membrane to the tiled shower
- the installation of safety glass where required

8.1.2 Taking account of the expert's assessment of visible components of the building together with the inspection records and the other documentation, I consider that the building complies with the provisions of the remaining relevant code clauses.

#### **8.2 Remaining code clauses: conclusion**

8.2.1 I consider that the expert's inspection and comments as outlined in paragraph 5.7.1 establishes that the building work complies with Clauses B1, E1, G1 to G4, G12 to G14 and H1 of the Building Code.

8.2.2 I also consider that, providing the documentation outlined in paragraph 8.1.1 is supplied, the building work will comply with Clauses C1, E3, F2 and G9 of the Building Code.

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

#### **9. Discussion**

- 9.1 The authority has concerns about the durability, and hence the compliance with the building code, of certain elements of the building taking into consideration the age of the building work completed in 1999.
- 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 The 9-year delay between the substantial completion of the building work consented in early 1999 and the authority’s refusal of a code compliance certificate raises the matter of when all the elements of the building complied with Clause B2. I have not been provided with any evidence that the authority did not accept that those elements complied with Clause B2 at a date in 1999.
- 9.5 It is not disputed, and I am therefore satisfied, that all the building elements complied with Clause B2 on 30 August 1999, refer paragraph 4.4.
- 9.6 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.
- 9.7 I continue to hold that view, and therefore conclude that:
- (a) the 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 building is no different from what it would have been if a code compliance certificate for the building work had been issued in 1999.

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

## **10. What is to be done now?**

- 10.1 A notice to fix should be issued that requires the owner to bring the house into compliance with the Building Code, identifying the items listed in paragraphs 7.4.1 and 8.1.1, and further investigation identified in paragraph 7.4.2.
- 10.2 The notice to fix may refer to any further defects that might be discovered in the course of investigation and rectification, but not specifying how those defects are to be fixed. It is not for the notice to fix to specify how the defects are to be fixed and the house brought to compliance with the Building Code. That is a matter for the owner to propose and for the authority to accept or reject.
- 10.3 I would suggest that the parties adopt the following process to meet the requirements of paragraph 10.1. Initially, the authority should issue the 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.
- 10.4 I note the expert's comment in paragraph 5.8 regarding the inadequate gate in the swimming pool fence, and I draw this matter to the authority's attention for appropriate action.
- 10.5 I also note that several changes from the consent drawings have been identified and I leave the matter of appropriate documentation of these changes to the authority for resolution with the applicant.

## **11. The decision**

- 11.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the house does not comply with Clauses B2 and E2 of the Building Code, and accordingly confirm the authority's decision to refuse to issue a code compliance certificate. There is insufficient information available to allow me to determine whether the alterations comply with Clauses C1, E3, and F2.
- 11.2 I also determine that:
- (a) all the building elements installed in the building, apart from the items that are to be rectified as described in this determination, complied with Clause B2 on 30 August 1999.
  - (b) the building consent is 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 30 August 1999 instead of from the time of issue of the code compliance certificate for all the building elements, except the items as set out in paragraphs paragraphs 7.4.1, 7.4.2, and 8.1.1 in Determination 2008/91.

- (c) once the matters set out in paragraphs 7.4.1, 7.4.2, and 8.1.1 have been rectified to its satisfaction, the authority is to issue a code compliance certificate in respect of the building consent as amended.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 30 September 2008.

John Gardiner  
**Manager Determinations**