



## Determination 2010/86

### Determination regarding the refusal of a code compliance certificate for a 13-year-old house with monolithic cladding at 464 Weedons Ross Road, West Melton, Canterbury



#### 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 DM Leighton (“the applicant”) and the other party is the Selwyn District Council (“the authority”), carrying out its duties as a territorial authority or building consent authority.
- 1.2 The matter for determination, under section 177(b)(i) of the Act<sup>2</sup>, is whether the authority’s decision to refuse to issue a code compliance certificate for the house was correct. The authority’s decision arose because it was not satisfied that the house complied with certain clauses of the Building Code (First Schedule, Building Regulations 1992).

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<sup>1</sup> The Building Act, Building Code, Compliance documents, past determinations and guidance documents issued by the Department are all available at [www.dbh.govt.nz](http://www.dbh.govt.nz) or by contacting the Department on 0800 242 243.

<sup>2</sup> 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

1.3 In order to determine this matter I must consider:

**1.3.1 Matter 1: The external envelope**

Whether the external envelope for the house (“the external envelope”) complies with Clause B2 Durability and Clause E2 External Moisture of the Building Code. The external envelope includes the wall and roof claddings and the windows, their configuration, components and junctions with other building elements. (I consider this in paragraph 6.)

**1.3.2 Matter 3: Compliance with the remaining Building Code clauses**

Whether various other items identified by the authority comply with the relevant clauses of the Building Code. (I consider this in paragraph 7.)

**1.3.3 Matter3: The durability considerations**

Whether the building elements comply with Building Code Clause B2 Durability, taking into account the age of the building work. (I consider this in paragraph 8.)

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. The decision is based on evidence received prior to the 7.1 magnitude earthquake of 4 September 2010, and as such it may contain items that have subsequently altered.

## **2. The building work**

2.1 The building work consists of a single storey house on a flat site, which is in a high wind zone with measurable snow loading for the purposes of NZS 3604<sup>3</sup>. The dwelling has a reinforced concrete perimeter foundation with concrete slab floor which sits approximately 250-300mm above the surrounding ground level, double glazed aluminium windows and monolithic wall cladding.

2.2 The roof is timber framed in five sections, and is clad in 1.5mm synthetic rubber membrane over 17.5mm plywood at a shallow 3° pitch. There are parapet walls on all elevations, and all roof stormwater discharges to internal sumps, which discharge into external rain heads with fitted overflows.

2.3 A wood fire chimney passes through the western end parapet wall, and a roof window is located above the gallery adjacent to the bathroom door. There are also two roof vents located on the eastern section above the bathroom.

2.4 A fish pond is located partially within the setback between the living and bedroom blocks of the dwelling, and extends approximately 5m out from the north wall. The pond is flush with the surrounding paving, and is freestanding and separated from the dwelling foundations by approximately 70mm. The pond is lined with a synthetic rubber membrane over concrete slab base and concrete block walls, and there is a concrete block cap around the top perimeter. The water level of the pond is maintained at 50mm below the capping by an overflow which discharges onto the adjacent lawn.

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

- 2.5 A recent extension has been constructed and attached to the eastern end of the dwelling. The extension was completed and a code compliance certificate issued on 29 January 2009. This part of the dwelling does not form part of this determination.
- 2.6 The external envelope of the dwelling is a system described as a painted plaster insulated cladding system direct fixed over a flexible backing of building wrap on 100x50mm timber framing, and finished with a modified plaster system.
- 2.7 The expert has noted that the wall framing he observed at the cut-out site was 100x50mm Douglas Fir, and that although the treatment level was not identified the framing is probably untreated. The roof framing was not identified.
- 2.8 The house has been assessed as having a high weathertightness risk (refer paragraph 6.2).

### **3. Background**

- 3.1 The authority issued a building consent (No. R416164) on 26 November 1996, under the Building Act 1991.
- 3.2 The authority carried out several inspections during construction of the dwelling, including a pre-line inspection on 15 April 1997 and a post-line inspection on 1 May 1997. The authority carried out a final inspection for the garage (not subject to this determination) on 30 July 1999, which included a note stating that:
- A Certificate will be issued soon for both projects.
- 3.3 An interim code compliance certificate was issued for the dwelling on 24 August 2000. The interim certificate was in respect of 'all work satisfactorily inspected at that time'.
- 3.4 At the request of the applicant, the authority carried out a final inspection of the dwelling on 12 March 2010, and identified nine items of concern regarding the building's compliance. A subsequent re-inspection of the work was recommended.
- 3.5 In a letter to the owner dated 20 April 2010, the authority stated its refusal to issue a Code Compliance Certificate for the dwelling due to the time lapse of 13 years between the date on which the building consent was granted and the date on which the 'practical completion inspection' was carried out. The authority stated that it:
- ... cannot now be satisfied on reasonable grounds that the building work and elements will continue to satisfy the durability provisions of the Building Code for the prescribed period after the Code Compliance Certificate has been issued.
- The [authority] considers that the building fails to meet the minimum performance requirements of following Building Code Clauses: B1.3.1, B2.3.1, E1.3.2, E1.3.3, E2.3.1, E2.3.2, E2.3.5, G4.3.5, G12.3.2 and G13.3.2.
- 3.6 Attached to the letter was a 'Site visit report', also dated 20 April 2010, that had been completed by authority staff. The site report gave a scope, a description of the work, an outline history of the building work and details about the building's compliance.
- 3.7 The report noted the same code clauses as noted in the letter were not compliant. With respect to specific items of non-compliance it noted items relating to:

- the possible effects of excavation in order to construct the pond, and the possible undermining of the building foundation (Clause B1).
- Water, if it overflowed the pond, leading to possible water ingress affecting the building elements (Clause B2)
- the EIFS cladding, including ground clearances, control joints penetrations, and flashings (Clause E2)
- the membrane roofing, including the membrane itself, gutters, flashings, overflow scuppers, and penetrations (Clause E2)
- the venting of a space heater (Clause G4)
- the potable water supply, being the possible backflow from the irrigation system and the pond (Clause G12)
- the foul water system, being the completion of the main vent, and surface water being able to enter the gully traps (Clause G13).

There did not appear to any specific reason given in the report why the building did not comply with Clause E1 Surface water.

3.8 In a letter to the authority dated 20 May 2010, the builder stated that the cladding system and head and side flashings at windows and doors were fitted as per the product manual, and that the wall and roof penetrations were all sealed according to good trade practice. The builder also noted that the general fall of the roof exceeds minimum requirements, and that the membrane lining is thicker than the standard normally specified.

3.9 The Department received an application for a determination on 27 May 2010.

## 4. Submissions

4.1 In the covering letter dated 20 May 2010, which accompanied the application for a determination, the applicant noted that there were discrepancies in the authority's paperwork regarding Notices of Inspection for the dwelling and for the garage, each of which had a separate consent issued. The applicant concludes that in 1996/97

... the inspections [for the dwelling] were carried out but were incorrectly recorded against the garage consent number and ... the final inspection for the dwelling in 1999 has also been incorrectly recorded against the garage consent number.

4.2 In requesting a determination, the applicant forwarded copies of:

- the consent drawings and specifications
- the inspection records
- a report detailing the site visit by the authority on 12 March 2010
- construction photographs
- the correspondence between the authority and the applicant
- the correspondence from the builder

- an inspection report dated 11 February from an independent property inspection company
  - the code compliance certificate application
  - various other information.
- 4.3 The inspection report dated 11 February 2010 was completed by an independent home inspection company following a visual inspection of the property on 11 February 2010. The report found that the dwelling was generally in sound condition apart from the following:
- cracking of the concrete floor in the hall near the front entrance
  - cracking of the concrete floor in the bathroom.
- 4.4 The authority acknowledged the application for determination in a detailed submission to the Department dated 8 June 2010. The authority outlined the background to situation, and its concerns about the time that had elapsed since the building consent was granted, the requirements of Clause B2 Durability. The submission restated the reasons for its refusal to issue the code compliance certificate also given in the site report (refer paragraph 3.6). The authority also questioned its potential liability under section 393. In response it is noted that the authority's potential liability is not a matter I can determine because it is outside my jurisdiction under the Act.
- 4.5 The draft determination was issued to the parties on 18 August 2010. The draft was issued for comment and for the parties to agree date when the building work, with the exception of the items to be fixed, complied with Clause B2 Durability.
- 4.6 The applicant accepted the draft without comment and the authority accepted the draft subject to non-contentious amendments. The parties agreed that compliance with Building Code Clause B2 was achieved in June 1997.

## **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 16 June 2010 and provided a report on 25 June 2010.
- 5.2 The expert noted that generally the dwelling has been completed in accordance with the consented plans.
- 5.3 The expert noted that, apart from the defects (described below), the cladding was 'installed to a good standard and has been very well maintained', and that 'overall the roof has been well maintained during its life'.

## 5.4 The external envelope

5.4.1 The expert noted that the cladding system was applied in accordance with the manufacturer's instructions and described the overall quality of installation of the exterior cladding system as good and that it has been well maintained.

5.4.2 The cladding has been finished to the required 50mm below the bottom plate, although in many areas the surrounding ground has been built up 'to within 40 to 50mm from the base of the cladding'. There is also vegetation growth close to the cladding in three locations.

### The windows

5.4.3 The expert noted that the windows and doors are powder coated aluminium and are in good condition. The joinery is inset, and head flashings have been installed.

5.4.4 The expert noted that sill flashings have not been fitted in accordance with E2/AS1 or with the manufacturer's recommendations, however most windows extend down to floor level and moisture levels below the windows where recorded were low. The expert concluded that the windows appeared to be performing adequately to date.

### The roof and parapets

5.4.5 The expert 'observed no signs of previous leaking internally' related to the design or fall of the roof or guttering. The roof cladding was originally well installed, but some maintenance and minor repair work is now due.

5.4.6 With respect to the parapets, the expert stated that the parapet cap flashings  
... were installed during construction and were reasonably well designed at a time when cap flashings were rarely used, however the caps do not have the 10° slope recommended in NZMRM code of practice 1995.

5.4.7 The expert noted that parapet caps and other associated roof flashings are generally reasonable and well installed, although 'the corner mitres have been finished to a lesser standard'. The corner mitres on the roof 'should have included an over-flashing to prevent possible moisture ingress', and that 'failure has already occurred at the southwest corner above the hallway in the bedroom block where a probe reading returned a 100% reading'.

5.4.8 Concerning the roof window, the expert observed that the flashings appeared to be functioning correctly but that there were a number of fixings protruding through the membrane side walls of the window and 'although these have been silicone sealed, a more permanent solution will be required'.

## 5.5 Moisture testing

5.5.1 The expert inspected the interior of the house and took invasive moisture readings below all window openings, at skirting level on some interior perimeter walls, and at other areas considered to be at risk. The readings varied from 8% to 14%.

5.5.2 The expert noted that the interior finish was of a 'very good standard and has been well maintained', and that there is 'no obvious evidence of internal joint cracking or damage'.

- 5.5.3 The expert took 45 invasive moisture readings through the exterior cladding at high risk locations. These readings varied from 8% to 26%, with 8 readings over 18% recorded. I note that moisture levels above 18% recorded after cladding is in place generally indicate that external moisture is entering the structure.
- 5.5.4 The expert also took 12 invasive moisture readings through the roof cladding at high-risk locations. Two readings over 18% were recorded (25% and 100%).

## **5.6 Other relevant code clauses**

### **B1 Structure**

- 5.6.1 The expert noted the depth of the pond as being 290mm, and that the foundation for the pond was not deeper than the adjacent foundations to the house. (The expert noted that the pond overflow was directed into the lawn and away from the house.)

### **C1 Outbreak of fire**

- 5.6.2 The expert noted that the wood fire was adequately vented.

### **G12 Water supplies**

- 5.6.3 The expert observed no irrigation systems or pool filling device was connected to the hose tap, but in the case of the pond the hose was lying close by.

### **G13 Foul water**

- 5.6.4 A main vent was noted as completed. (The application notes this being an air admittance valve).
- 5.6.5 Most of the gully traps did not have surrounds to prevent the ingress of surface water into the sewer system. The gully traps are not the 25mm above paved ground level and 100mm above unpaved ground level as required in Acceptable Solution G13/AS2.
- 5.7 A copy of the expert's report was provided to the parties on 5 July 2010. The authority made a submission in response to the expert's report dated 12 July 2010 which questioned the report's reference to surface water entering the gully trap.

## **Matter 1: The external envelope**

### **6. Weathertightness**

- 6.1 The evaluation of building work for compliance with the Building Code and the risk factors considered in regards to weathertightness have been described in numerous previous determinations (for example, Determination 2004/1).

#### **6.2 Weathertightness risk**

- 6.2.1 This house has the following features which influence its weathertightness risk profile:

##### **Increasing risk**

- the house is in a high wind zone

- the house has a monolithic cladding system fixed directly to the framing
- there are parapet walls on all elevations
- the house has a complex wall and roof design, which has resulted in some complex junctions and intersections
- a roof window has been installed above the gallery adjacent to the bathroom
- the chimney passes through a parapet wall
- there are inadequate ground clearances to many areas

#### **Decreasing risk**

- the dwelling is only a single storey
- a very good slope has been provided at the window sills
- there is good ground clearance to some areas of the dwelling
- the dwelling is generally well maintained.

6.2.2 When evaluated using the E2/AS1 risk matrix, these features show that all elevations of the house demonstrate a high weathertightness risk rating. I note that, if the details shown in the current E2/AS1 were adopted to achieve code compliance, the monolithic cladding to this house would require a drained cavity. However, I also note that a drained cavity was not a requirement of E2/AS1 at the time of construction.

### **6.3 Weathertightness performance**

6.3.1 Generally the cladding appears to have been installed to good trade practice and in accordance with NZS 4251<sup>4</sup> at the time of construction. However, taking account of the expert's report, I conclude that remedial work is necessary in respect of:

- the lack of adequate slope in the parapet capping
- the leak occurring at one location on the parapet
- the inadequate clearance between the base of the cladding and ground level in several locations.

6.3.2 I note the expert's comments regarding the flashings at windows and doors in paragraph 5.4.4, and accept that these areas are adequate in the circumstances.

### **6.4 Weathertightness conclusion**

6.4.1 I consider the expert's report establishes that the current performance of the external envelope is inadequate for the following reasons:

- Water is not adequately prevented from penetrating into the roof framing of the dwelling in specific locations due to poorly performing roof mitres and inadequate slope on the parapet capping.

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<sup>4</sup> Code of practice for solid plastering



- There is inadequate ground clearance at discrete locations around the base of the dwelling.
- 6.4.2 Consequently, it is my view that the house does not comply with Clause E2 of the Building Code.
- 6.4.3 Because the faults identified occur in discrete areas, I am able to conclude that satisfactory rectification of the items outlined in paragraph 6.4.1 will result in the external envelope being brought into compliance with Clause E2.
- 6.4.4 I note the expert's comment in regard to the particular need for maintenance to the complex envelope of this house. Effective maintenance of claddings is important to ensure ongoing compliance with Clauses B2 and E2 of the Building Code and is the responsibility of the building owner. The Department has previously described these maintenance requirements (for example, Determination 2007/60).

## **Matter 2: Compliance with the remaining Building Code clauses**

### **7. Discussion**

7.1 The authority also identified defects related to Building Code Clauses B1, E1, G4 and G12 and G13.

#### **7.2 Clause B1 Structure**

7.2.1 The authority is concerned that the excavation for the pond may have adversely affected the adjacent foundations of the house. Given the depth of the pond relative to the depth of the foundations, plus the lack of evidence of any related effects on the house, I consider that the pond has not had any adverse affect with respect to compliance with Clause B1.

#### **7.3 Clause C1 Outbreak of fire**

7.3.1 The authority has noted the possible absence of an air vent to the wood fire. The expert has verified the installation of a wall vent adjacent the fire.

#### **7.4 Clause G12 Water supplies**

7.4.1 While the potable water system was not connected to the pond and the irrigation system at the time of the expert's visit, I consider the intent is that it can be readily connected to both. The potable water system must be protected from, and avoid, contamination of the water supply. In my view this can be readily achieved by the use of atmospheric vacuum breakers, or a similar device, on the tapes serving the pond and irrigation system.

#### **7.5 Clause G13 Foul water**

7.5.1 I consider the surrounds to the gully traps should be raised to prevent surface water entering the foul water system.

7.5.2 An air admittance valve mounted at ground level has been used as a main vent to the foul water system. I consider an air admittance valve is not suitable in this situation

as it will not provide sufficient ventilation to avoid the accumulation of foul air and gases in the foul water system. The valve will also be susceptible to freezing in this location. An open vent complying with G13/AS1 provides one way of complying with this requirement.

## **7.6 Clause F7 Warning systems (Smoke alarms)**

7.6.1 I also note that the authority raised the lack of smoke alarms. While these were not a requirement of the Building Code when the work was consented, I strongly urge the owners to install these.

## **7.7 Conclusion**

7.7.1 In my opinion the building work does not comply with Building Code Clauses G12 and G13.

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

### **8. Discussion**

8.1 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.

8.2 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 completion date of the building during 1997.

8.3 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).

8.4 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.

8.5 In this case the delay between the completion of the building work in 1997 and the applicant’s request for a code compliance certificate has raised concerns that various elements of the building are now well through or beyond their required durability

periods, and would consequently no longer comply with Clause B2 if a code compliance certificate were to be issued effective from today's date.

- 8.6 It is not disputed, and I am therefore satisfied that all the building elements installed in the alteration complied with Clause B2 on 1 June 1997. This date has been agreed between the parties, refer paragraph 4.6.
- 8.7 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.
- 8.8 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 house had been issued in 1997.
- 8.9 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.

## **9. The actions of the authority**

- 9.1 I applaud the actions of the authority in undertaking the site visit report referred to in paragraph 3.6. Such a document provides useful advice to an owner about the compliance of their building and specific reasons for an authority's decisions. The value of the document to owners could be improved by clarifying the relationship of the specific matters of non-compliance to the broader requirements of the clauses of the Building Code.

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

- 10.1 I note that the authority has not issued a notice to fix. A notice to fix should now be issued that requires the owner to bring the building into compliance with the Building Code, identifying the items listed in paragraphs 6.3.1, 7.4, and 7.5, 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 the notice to fix to stipulate directly how the defects are to be remedied 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.
- 10.2 I 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.

## **11. The decision**

11.1 In accordance with section 188 of the Act, I determine that the building work does not comply with Clauses B2, E2, G12, and G13 of the Building Code, and accordingly I confirm the authority's decision to refuse to issue a code compliance certificate.

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 1 June 1997.
- (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 June 1997 instead of from the time of issue of the code compliance certificate for all building elements except the items to be rectified as set out in Determination 2010/86.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 16 September 2010.

John Gardiner  
**Manager Determinations**