

## Determination 2008/43

### Refusal of a code compliance certificate for a house with a 10-year-old building consent at 5 Clark Road, RD 1, Papakura



#### 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 of the building, J and D Biddick (“the applicants”) and the other party is the Franklin District Council (“the territorial authority”).
- 1.2 The initial matter for determination was the territorial authority’s decision to refuse to issue a code compliance certificate for a house because it had concerns regarding the commencement date of the durability period in relation to the external cladding. Subsequently, because of the territorial authority’s uncertainty as to the compliance of the external cladding of the building with relevant clauses of the Building Code<sup>2</sup> (First Schedule, Building Regulations 1992), the scope of this determination was extended to cover this other matter.
- 1.3 In order to determine the matters described in paragraph 1.2, I must determine the following questions:

#### **Matter 1: The code-compliance of the claddings**

Do the monolithic wall claddings, as installed to the external walls of the building, comply with the relevant clauses of the Building Code? By “the monolithic wall claddings 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 have evaluated the

<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).

weathertightness of the house using a framework that I describe more fully in paragraph 7 below.

## **Matter 2: The durability period of the claddings**

Do the claddings comply with Clause B2, taking into account the age of the building?

- 1.4 I note that the above matters relate only to the building's external cladding. I have not considered, nor have I been requested by the parties to consider, any other elements or aspects of the Building Code.
- 1.5 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.
- 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 relates to a two-storey detached house, which incorporates a large garage, built on a level site that is in a high wind zone in terms of NZS 3604<sup>3</sup>. Construction is of conventional light-timber framing built either on concrete slabs or timber framed floors. The building is very complex in plan and form.
- 2.2 The steeply pitched roofs are covered with fabric shingles supported on treated plywood and have hip, valley, and wall-to-roof junctions and 600mm wide eaves and verge projections. Four large dormer windows are set into this roofing and the roofs over these have 300mm wide eaves and verge projections. Four "Velux" skylights are also set into the roofing. An area of low-pitched roofing is formed at the top of the main house roof and this is covered with butyl rubber membrane, as are the main roof valley and apron flashings. The bay window projection to the dining room has a tiled pitched roof constructed over it.
- 2.3 An external deck with a radiused perimeter is situated outside the building line at the upper floor level on the north elevation of the building, and this is supported on two large timber columns and has a metal balustrade. A portico with a steeply pitched roof is situated outside the main entry and this is also supported on two large timber columns.
- 2.4 Laboratory tests (refer to paragraph 6.4) indicate that the timber used to construct the external walls of the house is not treated against decay. The expert is of the opinion that the external wall framing to the garage is all boron-treated.
- 2.5 The wall cladding to the external timber-framed walls is fixed directly to the framing over a variety of building wraps and comprises:
- 60mm thick EIFS<sup>4</sup> cladding with a textured and painted finish to the main walls of the house with projecting window sills formed from polystyrene finished to match the main cladding
  - a "Duraplast" system applied over "Hardibacker" sheets to the majority of the garage wing walls

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

<sup>4</sup> External Insulation & Finish System

- fibre-cement sheets with a textured and plastered finish to the dormer windows.

I note that the stonework veneer that is detailed to be erected at the base of the external walls was not in place when the building was inspected by the expert. In addition, the consented plans indicate that the garage walls were to have an exterior polystyrene cladding.

### **3. Background**

- 3.1 The territorial authority issued a building consent (No 17312) for the work on 26 February 1997, based on a building certificate issued by A1 Building Certifiers Ltd (“the building certifier”) dated 17 February 1997. The building certificate excluded on-site inspections for “plumbing and drainage” which were undertaken by the territorial authority.
- 3.2 The building certifier carried out inspections of the house during its construction, undertaking a ground floor pre-lining inspection on 19 September 2000. The building certifier found that the work covered by this inspection was not code-compliant.
- 3.3 The building certifier issued an interim code compliance certificate on 14 May 1998 in respect of the garage wing of the house, excluding the “septic tank and effluent”.
- 3.4 The building certifier ceased operating as a building certifier on 18 September 2002, and the territorial authority then took over the inspection process. The remaining inspections were carried out by the territorial authority from August 2003. On 22 August 2003, the territorial authority carried out a post-lining inspection of the house, excluding the garage.
- 3.5 Following a pre-final inspection undertaken on 5 July 2007, the territorial authority wrote to the applicants on 13 July 2007. The territorial authority listed documents that it required from the applicants and noted various items that required attention. The territorial authority also raised concerns regarding the monolithic cladding installed on the house. These concerns raised doubt as to the compliance of the cladding in terms of Clauses B2 Durability and E2 External Moisture.
- 3.6 The Department received the application for a determination on 10 September 2007.

### **4. The submissions**

- 4.1 The applicants submitted that the matter to be determined was the refusal of territorial authority to issue a code compliance certificate because of the face-fixed monolithic cladding.
- 4.2 The territorial authority submission dated 14 September 2007, stated:

Council believes that the cladding was fixed some 4 years ago. A variation or waiver from clause B2 of the Building Code to allow the durability period to start from is requested. A date near 1 August 2003 or earlier is justified.
- 4.3 In an email dated 20 September 2007 the territorial authority noted that it had not been involved with inspecting the face-fixed cladding. The territorial authority went on to say

“No one really can be sure it complies”.
- 4.3 It was this uncertainty, which was also set out in the territorial authority’s letter to the applicants dated 13 July 2007, that has led me to extend this determination to

cover the examination of the external cladding by the expert described in paragraph 1.4.

4.4 The territorial authority forwarded copies of:

- the plans and specifications
- the building consent and the consent documentation
- the building certifier's and the territorial authority's inspection records
- the interim code compliance certificate dated 14 May 1998
- the territorial authority's letter to the applicants, dated 13 July 2007.

## **5. The draft determinations**

5.1 A draft determination was sent to the parties on 26 September 2007. That draft, which only determined the Clause B2 matter, was issued for comment and for the parties to agree when the consented work complied with Building Code Clause B2 "Durability".

5.2 The applicants and the territorial authority agreed that compliance with Clause B2 was achieved on 1 August 2003.

5.3 A second draft determination was forwarded to the parties for comment on 29 April 2008. The second draft dealt with Building Code Clause E2 "External moisture" as well as Clause B2 "Durability".

5.4 Both parties accepted the second draft but pointed out a typographical error in the draft. I have amended the determination accordingly.

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

6.1 As discussed in paragraph 1.5, I engaged an independent expert, who is a member of the New Zealand Institute of Building Surveyors, to provide an assessment of the condition of the claddings. The expert inspected the cladding of the building on 1 February 2008, and furnished a report that was completed on 20 March 2008.

6.2 The expert was of the opinion that the cladding generally "appears straight flat and fair" and the "coating appears to be reasonably uniform and sound". However, the cladding workmanship is to a "reasonable to poor standard" and the workmanship on the painting is below standard. In addition, only minimum maintenance appeared to have been undertaken on the building. The expert removed sections of the cladding at several locations to examine the construction detailing and I am prepared to accept that these examples are representative and apply to similar details throughout the house.

6.3 The expert took non-invasive moisture readings at the exterior walls, and two higher readings were recorded at one location. The expert also noted evidence of moisture ingress at one other area. The expert also took 114 invasive moisture readings into the bottom or sill plates of the external framing and 12 readings were higher and 5 much higher than the likely equilibrium moisture levels. The expert also noted that the readings were taken after a prolonged period of minimal rainfall.

6.4 Indicative strength tests were also taken at each of the 114 investigated locations and low-strength readings were obtained at 15 of these. Visual Colour Ratings (VCR) also indicated that timber at over half of the investigated locations was likely to be

damaged and to have lost “cell wall strength”. This observation was verified by tests undertaken by an independent testing laboratory on timber samples taken from 4 of the investigated locations. The tests indicated that the timber sample taken from the garage wall framing was moderately treated with boron but had lost structural integrity due to fungal decay. The other 3 samples that were taken from the house wall framing were found to be untreated and 2 of these had also lost structural integrity.

6.5 The expert made the following comments regarding the cladding:

- There is cracking in the polystyrene cladding at several locations.
- The base of the cladding is too close to the finished ground and paving levels at some locations.
- The galvanised nailing system used to fix the EIFS cladding does not penetrate the framing to a sufficient depth, and where copper flashings have been penetrated, there are likely to be corrosion problems.
- The ends and edges of the polystyrene cladding lack end caps or angles.
- A roof/polystyrene cladding junction at the dining bay window projection is incorrectly formed.
- Some fascia ends are embedded in the cladding.
- No uPVC angle or cap has been installed at the junction of the polystyrene sill details and the main cladding, and the finish to the base of the jamb flashings at these sills is inadequate.
- The flashings used in conjunction with the Duraplast system are incorrect or are missing, and their installation does not comply with the manufacturer’s requirements.
- There are no head, jamb or sill flashings installed at the dormer windows.
- The garage door opening lacks a head flashing.
- The penetrations through the claddings are inadequately sealed.
- The deck design is faulty and is allowing moisture ingress into the building, the jointing of the deck membrane is breaking down, and the junction of the membrane with the house cladding is inadequate.
- The deck handrails fixings are faulty and are not sealed.
- The ends of the apron flashings lack kick-outs.
- The proposed stonework veneer, which has yet to be constructed, has a potential to fail if built as shown on the documents. There is also a need to review the flashings and base details of the cladding that has been installed at the proposed veneer locations.

6.6 The expert also noted that at some locations the roof tiles are not correctly bonded to the eaves or verge flashings and a vent pipe passing through the roof is inappropriately flashed. The expert also had concerns as to the effectiveness of the base support of the elevated hot water cylinder.

- 6.7 Copies of the expert's report were forwarded to the parties. By letter received by the Department on 14 April 2008, the applicants explained how some of the water damage noted by the expert had happened. The applicants reported that the vent pipe flashing (see paragraph 6.6) has since been fixed. They also acknowledged deficiencies in the external paintwork which they said they intended to remedy when the house is finished.

## **Matter 1: The code compliance of the claddings**

### **7. Evaluation for code compliance**

#### **7.1 Weathertightness evaluation framework**

- 7.1.1 In evaluating the design of a building and its construction, it is useful to make some comparisons with the relevant Acceptable Solution<sup>5</sup>, in this case E2/AS1, which will assist in determining whether the claddings of this house 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; and
  - Usually when there is non-compliance with one provision of an Acceptable Solution, it may be necessary to add some other provision to compensate for that in order to obtain compliance with the Building Code.
- 7.1.2 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 overall design of the building, the surrounding environment, the detailed 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 (refer to Determination 2004/1 *et al*)<sup>6</sup> relating to cladding and these factors are also used in the evaluation process.
- 7.1.3 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 will need to 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.

#### **7.2 Weathertightness risk**

- 7.2.1 In relation to the weathertightness characteristics, I find that the building:
- is situated in a high wind zone
  - is two-storeys high and is of a complex shape on plan
  - has generally 600mm wide eaves projections that provide good protection to the cladding beneath them

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<sup>5</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>6</sup> Copies of all determinations issued by the Department can be obtained from the Department's website.

- has one deck that is external to the building line
- has external wall framing that is not treated to a level that is effective in helping resist decay if it absorbs and retains moisture.

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

7.2.3 When evaluated using the E2/AS1 risk matrix, the weathertightness features outlined in paragraph 7.2.1 show that all elevations of the house demonstrate a medium weathertightness risk. I note that, in order to comply with the current E2/AS1, the monolithic claddings of this building would require a drained cavity.

### 7.3 Discussion

7.3.1 Taking into account the expert's report, I am satisfied that the current performance of the claddings installed on this house is inadequate because it has not been installed according to good trade practice. In particular, the cladding is at present allowing water penetration into the walls through defects in the cladding, which in turn has led to the decay of the framing timber at some locations. In particular, the claddings demonstrate the key defects listed in paragraph 6.5 and have only been maintained to a minimum degree. 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 systems. 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 systems as installed complies with either Clause B2 or Clause E2 of the Building Code.

7.3.2 I find that, because of the extent and apparent complexity of the faults that have been identified with the claddings, I am unable to conclude, with the information available to me, that remediation of the identified faults, as opposed to partial or full re-cladding, could result in compliance with Clauses B2 or E2. I consider that final decisions on whether code compliance can be achieved by either remediation or re-cladding, or a combination of both, can only be made after a more thorough investigation of the cladding. This will require a careful analysis by an appropriately qualified expert. Once that decision is made, the chosen repair option should be submitted to the territorial authority for its comment and approval. If the territorial authority chooses to reject the proposal, then the applicants are entitled to seek a further determination on whether the proposed remedial work will lead to compliance with the requirements of Clauses B2 and E2.

7.3.3 The expert has also referred to some roofing elements and the hot water cylinder support as requiring attention. These should also be included in the rectification process.

7.3.4 As noted in paragraph 2.5, the external wall cladding to the garage is shown on the plans as polystyrene, which varies from the cladding that was actually used.

Accordingly, the consent documentation needs to be amended to take into account this change.

## **Matter 2: The durability period of the claddings**

### **8. Discussion**

- 8.1 The territorial authority has concerns about the durability, and hence the compliance with the Building Code, of the claddings, taking into consideration the completion date of 2003 of the building work subject to the consent. From the information that I have received, there is no clear indication of when the monolithic cladding was actually installed.
- 8.2 However, the territorial authority has since stated that it has reason to believe that the claddings complied with the building consent and the Building Code at a date near 1 August 2003.
- 8.3 In response to the first draft determination, the applicants and the territorial authority agreed that the claddings achieved compliance with B2 on 1 August 2003.
- 8.4 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).
- 8.5 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.
- 8.6 It is not disputed, and I am therefore satisfied, that all the building elements complied with Clause B2 on 1 August 2003. This date has been agreed between the parties, refer paragraph 5.2.
- 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 the views expressed in the previous related determinations, and therefore conclude that:
- (a) the territorial authority has the power to grant an appropriate modification of Clause B2 in respect of all of the elements of the building.
  - (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 code compliance certificates in respect of the building work had been issued in 2003.

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

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

- 9.1 I note that the territorial authority has not issued a notice to fix. I suggest that the territorial authority issue a notice to fix that requires the owners to bring the building into compliance with the Building Code, identifying the defects listed in paragraphs 6.5 and 6.6 and referring to any further defects that might be discovered in the course of rectification. It is not for the notice to specify how compliance is to be achieved as that is for the owner to propose and for the territorial authority to accept or reject. It is important to note that the Building Code allows for more than one method of achieving compliance.
- 9.2 I would suggest that the parties adopt the following process to meet the requirements of paragraph 9.1. Initially, the territorial authority should issue a new notice to fix. The applicant should then produce a response to this in the form of a technically robust proposal, together with suitable amendments to the plans and specifications, produced in conjunction with an expert, 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. The decision**

- 10.1 In accordance with section 188 of the Building Act 2004, I determine that:
- (a) the claddings do not comply with Clauses B2 and E2 of the Building Code, and accordingly I confirm the territorial authority's decision to refuse to issue a code compliance certificate.
  - (b) the claddings installed in the building, apart from the items to be rectified, complied with Clause B2 on 1 August 2003
  - (c) the building consent No 17312 is hereby modified as follows:

The building consent is subject to a modification to the Building Code to the effect that, for all the cladding elements, apart from the items to be rectified, Clause B2.3.1 applies from 1 August 2003 instead of from the time of issue of the code compliance certificate as set out in Determination 2008/43.
  - (d) following the modification set out in (c) above, and once all the rectification work has been carried out to the satisfaction of the territorial authority, the territorial 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 29 May 2008.

John Gardiner  
**Manager Determinations**