

## Determination 2007/25

### Refusal of a code compliance certificate for a building with a monolithic cladding system at 31 Katerini Grove, Papamoa, Tauranga



#### 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, Determinations Manager, Department of Building and Housing (“the Department”), for and on behalf of the Chief Executive of that Department. The applicant is the owner, the Beany Trust (“the applicant”), acting through a solicitor, (“the agent”) and the other party is the Tauranga City Council (“the territorial authority”). The agent has identified the builder of the house, Hannah Homes Ltd (“the builder”) as a related party to the dispute.
- 1.2 This determination arises from the decision of the territorial authority to refuse to issue a code compliance certificate for a 6-year old house because it is not satisfied that it complies with clauses B2 “Durability” and E2 “External Moisture” of the Building Code<sup>22</sup> (First Schedule, Building Regulations 1992).

<sup>1</sup> The Building Act 2004 is available from the Department’s website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

<sup>2</sup> The Building Code is available from the Department’s website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

- 1.3 The matter to be determined is whether the cladding as installed on the building (“the cladding”) complies with clauses B2 and E2 (see sections 177 and 188 of the Act). 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.
- 1.4 In making my decision, I have considered the submissions of the parties, the report of the independent expert commissioned by the Department to advise on this dispute (“the expert”), and the other evidence in this matter. I have evaluated this information using a framework that I describe more fully in paragraph 6.1.
- 1.5 In this determination, unless otherwise stated, references to sections are to sections of the Act and references to clauses are to clauses of the Building Code.

## **2. The building**

- 2.1 The building work consists of a detached house situated on an excavated sloping site, which is in a high wind zone for the purposes of NZS 3604<sup>3</sup>. The house is two storeys high with a basement level under two-thirds of the upper floor. Construction is conventional light timber frame, with concrete block footings, a concrete slab to the basement, timber piles to the subfloor area, aluminium windows and monolithic wall cladding. The lower walls are timber framed, while upper walls are solid timber with the external walls overlaid with battens to support the cladding. The house shape is a simple “L” shape, with a 25° pitch profiled metal gable and hipped roof. Eaves projections are generally more than 600mm wide, except for two projecting “bays” on the upper south and east elevations where eaves are restricted to the gutter width only. The gable end to the west projects about 1.6m beyond the living room wall and is supported by timber corner posts.
- 2.2 A large timber deck, with spaced timber slats, extends from the living room towards the west. A smaller timber deck, with a paved floor and open timber balustrades, extends from the north wall of the dining area.
- 2.3 The expert has noted that the framing timber was specified as “dry frame”, and the timber framing exposed during his inspection was stamped as “kiln dried” (refer paragraph 5.3). I have received no information as to the treatment if any of the battens to the solid timber upper walls. Based on this evidence, I accept that the external wall framing and upper wall battens are unlikely to be treated timber.
- 2.4 The cladding system is what is described as monolithic cladding, and is an “Eterpan” system, with 6mm thick fibre-cement sheets finished with an applied textured plaster system. The backing sheets to the basement walls are fixed through the building wrap to the framing. The backing sheets to the upper walls are fixed through the building wrap to 40mm vertical and horizontal timber battens, which are then fixed to the “Lockwood Initial Homes” solid timber walls (refer paragraph 5.4).
- 2.5 I have received no evidence of producer statements or warranties for the cladding.

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

### 3. Sequence of events

- 3.1 It appears that the territorial authority issued a building consent (No 3270), which I have not seen, on 28 June 2000, based on a building certificate (No 00/109) dated 15 June 2000 issued by Building Inspection and Advisory Services Ltd (“the building certifier”).
- 3.2 I have received no records of inspections undertaken by the building certifier during construction, but it appears that the house was substantially completed during 2000.
- 3.3 Sometime after completion of the house, the building certifier ceased operating. It appears that Bay Inspections inspected the house in September 2005 and identified a number of outstanding items. I note that Bay Inspections is a contractor providing building regulatory services to the territorial authority (“the contractor”).
- 3.4 It appears that the applicant subsequently sought a code compliance certificate and the contractor carried out a final inspection on 6 September 2006. The contractor’s inspection record summarised the history of the project and noted a number of concerns relating to the wall cladding.
- 3.5 In a letter to the territorial authority dated 11 September 2006, the contractor attached the inspection report and noted that no evidence of moisture had been recorded during non-invasive testing. However the contractor also explained various concerns with regard to the wall cladding and recommended:
- ...that you advise the owner that, while there is no visible evidence that the building is not performing in accordance with NZBC E2 a Code Compliance Certificate will not be forthcoming because cladding installation faults could be resulting in moisture ingress or could lead to problems in the future.
- 3.6 The territorial authority subsequently issued a notice to fix dated 26 September 2006 to the applicant, which stated:
- Council believes that on the information supplied by Bay Inspections dated 6 September 2006 that the building at the abovementioned property, constructed under Building Consent 3270, may no longer comply with clause E2 (weathertightness) and clause B2 (durability) of the NZ Building Code. With this information Tauranga City Council is unable to issue a Code Compliance Certificate.
- 3.7 In a letter to the contractor dated 29 September 2006, the agent noted that the applicant was marketing the property for sale and asked for clarification on a number of the issues raised in the letter dated 11 September 2006, including:
- whether the cladding would have complied with the building code and the manufacturer’s instructions at the time of construction
  - whether the manufacturer’s recommendations on the thickness of the fibre cement backing sheets had changed since the time of construction in response to general weathertightness concerns
  - if the building code and manufacturer’s instructions had changed since construction, where copies of requirements in force at the time could be obtained

- if the building code and manufacturer's instructions had changed since construction, whether the cladding issues raised by the contractor would have prevented a code compliance certificate being issued at the time of completion of the house.

3.8 In a letter to the agent dated 24 October 2006, the contractor explained that the building code had not changed since the time of construction, although a new acceptable solution E2/AS1 had been issued that now covered fibre-cement cladding systems. The contractor noted that the limited information available on "Eterpan" specified a similar thickness of backing sheet as that used for other more common products. The contractor also explained that it was not acceptable practice in 2000 (or since) to have sheet joints in line with window jambs, no vertical control joints or inadequately sealed window jambs. However the contractor added that the house might have been issued with a code compliance certificate in 2000 if no cracks were apparent at the time, as the general understanding of weathertightness had improved since that time.

3.9 On 21 November 2006, the Department received an application for a determination from the agent on behalf of the owners.

#### **4. The submissions**

4.1 Within the application, the agent noted that the matter for determination was the territorial authority's refusal to issue a code compliance certificate for the house due to non-compliance with clauses E2 and B2 of the building code.

4.2 The agent forwarded copies of:

- the drawings and some of the consent documentation
- the contractor's report on the final inspection of 6 September 2006
- the notice to fix dated 26 September 2006
- the correspondence with and between the territorial authority and the contractor.

4.3 The territorial authority forwarded copies of:

- the contractor's report on the final inspection of 6 September 2006
- the letter from the contractor dated 11 September 2006
- the notice to fix dated 26 September 2006.

4.4 Copies of the applicant's submission were provided to the parties, which made no submission in response.

4.5 A copy of the draft determination was forwarded to the parties for comment on 18 January 2007. Both parties accepted the draft without comment.

## 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 cladding of the building on 18 December 2006, and furnished a report that was completed on 20 December 2006. The expert noted that patchy paintwork indicated past repair work to cladding joints, although the standard of workmanship generally appeared reasonable with “tidy and effective flashings” and generally adequate cladding clearances and penetrations.
- 5.3 The expert noted that the windows were face-fixed with metal head flashings, textured coating applied after the window installation, and sealant applied at the edges of jamb flanges. The expert removed a small section of cladding at the sill to jamb junction of a garage window to inspect the underlying window installation, and noted that the timber framing was stamped as “kiln dried”.
- 5.4 The expert also removed a small section of cladding at the interstorey junction on the wall of an upper floor bedroom and noted that the underlying vertical and horizontal battens fixed to the solid timber walls were tightly butted (with no evidence of timber treatment). The battens projected beyond the lower wall framing to allow for an overlapped interstorey junction that provided capillary gaps behind the bottom of the upper wall cladding.
- 5.5 The expert took non-invasive moisture readings through internal linings of exterior walls throughout the house, and noted no elevated readings. 4 invasive moisture readings were taken through the wall cladding at risky areas, and one elevated reading of 19% was recorded in the framing at the window cut-out. Moisture levels above 18% recorded after cladding is in place generally indicate that external moisture is entering the structure.
- 5.6 Commenting specifically on the cladding, the expert said:
- the fibre-cement backing sheets are only 6mm thick (reducing to about 3mm at the tapered joint) in contrast to the 7.5mm recommended by manufacturers of flush-finished fibre-cement cladding systems
  - the joints in the backing sheets are visible, with cracks and bulges apparent
  - there is no evidence of vertical control joints to wall areas on the north, east and west walls, where the cladding lengths exceed the 5.4m limit between control joints recommended by manufacturers of flush-finished fibre-cement cladding systems
  - a number of joints in the backing sheets line up with window jambs (resulting in joint cracks), which is not in accordance with the manufacturer's instructions. There are also flush-finished horizontal joints between some windows, where the joint lines up with the window heads

- the face-fixed windows and doors have no “Inseal” tape or sealant between the window and door jamb flanges and the cladding, as recommended by manufacturers of similar cladding products, and the coating has been applied after the window installation (with unsealed fibre-cement under the window flanges)
- the horizontal battens behind the upper wall cladding are tightly butted against the vertical battens, preventing any drainage so trapping any moisture within the cavity
- there is no head flashing above the garage door
- there is no drainage gap between the timber and paved deck floors and the wall cladding with the coating applied after the deck installation. The uncoated upper wall cladding extends below the west deck, with water marks suggesting some moisture absorption into the fibre-cement
- the clearances from the bottom of the cladding to the ground and paving are inadequate at the entry paving and beside the garage doors.

5.7 A copy of the expert’s report was provided to each of the parties on 8 January 2006.

## **6. Evaluation for code compliance**

### **6.1 Evaluation framework**

6.1.1 In evaluating the design of a building and its construction, it is useful to make some comparisons with the relevant Acceptable Solution<sup>4</sup>, in this case E2/AS1, 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:

- Some Acceptable Solutions cover the worst case, so that they may be modified in less extreme cases and the resulting alternative solution will still comply with the Building Code.
- Usually, when there is non-compliance with one provision of an Acceptable Solution, it will be necessary to add some other provision to compensate for that in order to comply with the Building Code.

6.1.2 The approach in determining whether building work is weathertight and durable and is likely to remain so, is to apply the principles of weathertightness. This involves the examination of the design of the building, the surrounding environment, the design features that are intended to prevent the penetration of water, the cladding system, its installation, and the moisture tolerance of the external framing. The Department and its antecedent, the Building Industry Authority, have also described weathertightness

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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).

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 simple in plan and form
- has two timber framed decks, one of which has a paved floor
- has eaves and verge projections greater than 600mm over most walls
- has monolithic cladding that is fixed over an undrained cavity to upper walls
- has monolithic cladding that is fixed directly to the lower wall framing
- has external wall framing and cavity battens that are not treated to a level that will provide resistance to the onset of decay if the timber absorbs and retains moisture.

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

## 7. Discussion

- 7.1 Taking into account the expert's report, I am satisfied that the current performance of the monolithic cladding is inadequate because it has not been installed according to good trade practice and to the manufacturer's instructions. In particular, the cladding demonstrates the key defects listed in paragraph 5.6 and in the expert's report. 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

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

the structure does not have sufficient provisions that would compensate for the lack of a drained and ventilated cavity.

- 7.2 Because of the extent of moisture penetration and apparent complexity of the faults that have been identified with the cladding, I am unable to conclude that fixing the identified faults, as opposed to partial or full re-cladding, could result in compliance with clause E2.
- 7.3 I consider that final decisions on whether code compliance can be achieved by either repairs 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 remedial option should be submitted to the territorial authority for its comment and approval. If the territorial authority chooses to reject the proposal, then the applicant is entitled to seek a further Determination on whether the proposed remedial work will led to compliance with the requirements of clauses E2 and B2.

## **8. The decision**

- 8.1 In accordance with section 188 of the Act, I hereby determine that the building does not comply with clauses B2 and E2 of the Building Code, and accordingly confirm the territorial authority's decision to refuse to issue a code compliance certificate.
- 8.2 I note that the territorial authority has issued a notice to fix. The territorial authority should now issue a new notice to fix that requires the owners to bring the building up to compliance with the Building Code, including those items outlined in 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. That is a matter for the applicant 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.
- 8.3 I would suggest that the parties adopt the following process to meet the requirements of paragraph 8.2. Initially, the territorial authority should issue the new notice to fix, listing all the items that the territorial authority considers to be non-compliant. 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 27 February 2007.

John Gardiner  
**Determinations Manager**