

## Determination 2007/132

### Refusal to issue a code compliance certificate for a house with monolithic cladding at 87C Kaurilands Road, Titirangi



#### 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 applicant is the owner of the house, A Fallahi (“the applicant”), and the other party is the Waitakere City Council (“the territorial authority”).
- 1.2 This determination arises from the decision of the territorial authority to refuse to issue a code compliance certificate for a 5-year-old house because it is not satisfied that it complies with clauses B2 “Durability” and E2 “External Moisture” of the Building Code<sup>2</sup> (First Schedule, 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 The matter for determination is whether the cladding as installed on the house (“the cladding”) complies with clauses E2 and B2 of the Building Code. By “the cladding as installed” I mean the components of the system (such as the backing materials, the flashings, the joints and the plaster and/or the coatings) as well as the way the components have been installed and work together.
- 1.4 In making my decision, I have considered the submissions of the parties, the report of the independent expert (“the expert”) commissioned by the Department to advise on this dispute, 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 large two-storey detached house that is situated on a steeply sloping site, which is in a moderate wind zone for the purposes of NZS 3604<sup>3</sup>. The house has been divided into two self-contained units, the upper level with 3 bedrooms and the lower with 2 bedrooms. The construction of the house is conventional light timber frame, with a concrete slab, concrete block foundations and retaining walls, timber-framed subfloors to some areas, monolithic cladding and aluminium windows.
- 2.2 The house is fairly complex in plan and form, with 20° pitch metal tile gable roofs over the upper level and a 12° pitch lean-to roof to the projecting southwest corner. Eaves and verge projections range from 250 mm to about 500 mm, except for several projecting walls that have no eaves and a canopy above the entrance. A horizontal band of coated polystyrene is used at the inter-storey junction and as a decorative border around some of the windows.
- 2.3 A two-storey deck, with tiled floors and open timber balustrades, extends to the west from the living areas of both levels. The upper deck adjoins the lean-to garage roof; separated by a timber-framed balustrade at the south end, which is clad in painted fibre-cement sheet with a timber capping. A similar two-storey deck extends to the north from the bedroom areas of both levels. The upper deck floor is tiled, while the lower has spaced timber slats. A small deck and ramp, with a tiled floor, provides access to the upper entry from the top driveway.
- 2.4 The expert observed no evidence as to timber treatment and noted that the wall framing is likely to be kiln-dried untreated timber. The drawings specify H3 treatment for the deck framing but are silent on the wall framing treatment. Given the date of construction and the lack of other evidence, I consider that the external wall framing is unlikely to be treated.
- 2.5 The cladding system to the building is what is described as monolithic cladding, with 7.5 mm thick fibre-cement backing sheets fixed through the building wrap to the

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

framing, and finished with an applied textured coating system. There are also various panels of painted fibre-cement and some areas of decorative ceramic tiles adhered to the backing sheets.

### **3. Background**

3.1 The territorial authority issued a building consent (No. 20011152) on 26 April 2001 for the original house, which seems to have been completed within the following year. I have received no details of this consent or of any inspections undertaken during construction.

3.2 A second building consent (No. 20021963) was issued to the original owner of the house on 13 November 2002 for alterations to sub-divide the house into two self-contained units. I have received no details of any inspections undertaken during these alterations.

3.3 It appears that a final inspection was carried out by the territorial authority in 2003. In a letter to the original owner, dated 12 September 2003, the territorial authority identified a list of issues that required attention, which included:

Independently qualified person as recommended by BRANZ to inspect exterior cladding ... and forward report to Waitakere City Council with special emphasis placed on exterior tiling over cladding.

I have seen no evidence that any such specific cladding inspection was carried out. The house was subsequently sold to the applicant with the original owner agreeing to complete the work required to gain a code compliance certificate.

3.4 On 29 September 2004 the territorial authority issued a Notice to Rectify, which appears to correspond with an undated copy of "Particulars of contravention" (refer paragraph 3.7) submitted by the applicant as a separate document.

3.5 As little progress had been made on outstanding matters by the original owner, a new agreement was made in January 2005, passing the responsibility for completion of the work to the applicant.

3.6 According to the applicant, most of the items listed in the territorial authority's letter of 12 September 2003 were completed by the applicant, and the territorial authority carried out a further final inspection sometime during 2005. The applicant also submitted that the territorial authority issued a new list of items (which I have not seen), one of which included the requirement to remove and replace the monolithic cladding.

3.7 The applicant has submitted a copy of "Particulars of contravention", which he has titled "Last inspection". This is undated, but appears to have resulted from the second final inspection as an attachment to a Notice to Rectify (or a notice to fix), although I have received no copy of any notice issued during 2005. The "Particulars of Contravention" noted:

Monolithic cladding systems without a 20mm cavity, provision for adequate ventilation, drainage, and vapour dissipation will, in the event of leakage and/or the

effect of residual moisture, cause irrecoverable damage to the structural elements of the building.

1. You are required to:

- Provide adequate ventilation to the monolithic cladding and into the wall frame space by means of either a ventilated cavity or alternate approved system; or
- Remove the monolithic cladding and replace with an approved cladding system . . .

3.8 I am not aware of further communication between the applicant and the territorial authority. On 27 June 2007 the Department received an application for a determination.

## **4. The submissions**

4.1 In a covering letter to the Department dated 21 June 2007, the applicant briefly summarised the history of the project and explained the problems relating to completing the outstanding work following the purchase of the house. The applicant expressed dismay at the increase in requirements between the successive final inspections with regard to the apparent requirement to reclad the building and asked whether this is really necessary for a six year old house as there was no evidence of moisture problems, noting:

This is the first time we have heard of this needing to be done for this property and is a huge set back for us as we are nearly finished with all the other areas of work for the completion of construction.

4.2 The applicant forwarded copies of:

- the consent drawings
- the 2002 building consent for the alterations
- part of the letter from the territorial authority dated 12 September 2003
- a Notice to Rectify dated 29 September 2004 (with no attached details)
- the undated “Particulars of contravention”
- various other statements and information.

4.3 Copies of the submissions and other evidence were provided to each of the parties. Neither party made any further submissions in response to the submission of the other party.

4.4 The draft determination was issued to the parties for comment on 13 September 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 monolithic cladding on 15 August 2007, and furnished a report that was completed on 20 August 2007. The expert noted that roof flashings generally appeared adequate and, despite significant defects, the wall cladding was “sufficiently competent that there were very few cracks”, with the coating “generally uniform, well adhered and free from fading, chalking and other deterioration”.
- 5.3 The expert noted that the stamped consent drawings dated from both 2001 and 2002, and outlined a number of changes from these, including:
- layout changes to the lower level
  - an upper deck added to the west elevation
  - the entry steps changed to a tiled deck and ramp
  - weatherboard cladding changed to monolithic cladding
  - profiled metal roof cladding changed to pressed metal tiles.
- 5.4 The expert noted that the windows were face-fixed with adequate metal head flashings and no sill or jamb flashings, with the coating applied after the window installation. The expert removed a small section of coating at the jamb of a window in order to insert a probe behind the window flange and noted that no seals had been installed and a small fillet of sealant had been applied at the outer edge of the flange. The expert also removed a small section of a polystyrene window border at a jamb to sill junction, and noted the same absence of seals in this situation.
- 5.5 The expert removed a small section of polystyrene band at the inter-storey junction to observe the underlying joint and noted that the band was adhered to uncoated backing sheets, with the horizontal joint filled and no jointer or flashing.
- 5.6 The expert inspected and took non-invasive moisture readings throughout the interior of the house and some “borderline” readings were observed adjacent to joinery. The expert took 11 invasive moisture readings through the lining or cladding at high risk locations and, while 3 readings were between 11% and 13%, relatively elevated readings were recorded as follows:

### South elevation

- 19% in the bottom plate between the garage doors
- 16% in the jamb stud under the polystyrene band

### West elevation

- 21% in the bottom plate of the upper dining room corner

- 19% in the framing of the clad deck balustrade
- 36% in the stud below the deck to wall junction

#### **North elevation**

- 27% in the upper wall corner, adjacent to the wall tiles
- 17% below the deck to wall junction
- 29% in the bottom plate beside the concrete block retaining wall.

Moisture levels that vary significantly after cladding is in place generally indicate that external moisture is entering the structure.

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

- the bottom of the cladding butts against the paving beside the garage doors
- there is no clearance from the cladding to the deck tiles
- the cladding extends behind the tiles of the entry deck and ramp
- the cladding is sealed against the flashing over the concrete foundation walls, with no anti-capillary gap provided and, in some areas, the flashing clearance above ground is inadequate
- the timber deck slats of the lower north deck butt against uncoated fibre-cement, with the coating having been subsequently applied
- decorative tiles installed around various doors, over uncoated fibre-cement backing sheets, are not adequately weatherproof
- there are no vertical control joints in the upper lounge/dining west wall, and in the south and west garage walls, where the dimensions exceed the 5.4m limit recommended by the manufacturer
- there are various areas of unfinished fibre-cement, including at the entry (where the paintwork is degrading), the upper west deck balustrade, beside the wall tiles, below decks, and at various other locations
- there is no flashing or jointer at the inter-storey junction
- some of the backing sheet joints line up with window and door jambs
- there is an unfilled joint at the corner of the upper dining west wall and a crack under the door
- there appears to be no underlying flashing at the concrete block to fibre-cement inter-cladding junction at the lower north wall, as moisture is penetrating into the adjacent timber
- there is no underlying Inseal or sealant between the fibre-cement and the window jamb flanges, with the coating having been applied following the joinery installation, and some sills lack an adequate drainage gap
- the garage doors lack head flashings

- some timber handrails were installed before the coating and have been subsequently cut back, exposing uncoated fibre-cement
- the membrane under the timber capping to the clad balustrade on the upper west deck is poorly weatherproofed at the end and at the junction with the wall, and there is an unsealed joint between the balustrade and wall claddings
- the membrane under the deck tiles extends under a timber “kerb” at the edges of the tiled decks and is poorly adhered at the edges and junctions with the walls, with moisture trapped and moss growth apparent
- the upper west deck is ponding and lacks adequate drainage, with moisture penetrating through the floor into the deck framing
- the deck to wall junctions of the tiled decks are poorly weatherproofed, with wet timber apparent below (where there are areas of unfinished fibre-cement)
- various fixing brackets have been fitted to unfinished fibre-cement, with the coating subsequently applied
- the electricity meter box is unflushed and unsealed.

5.8 A copy of the expert’s report was provided to each of the parties on 22 August 2007.

5.9 The territorial authority responded in an email to the Department dated 27 August 2007, noting no general issues with the report apart from one of the expert’s conclusions which the territorial authority intended to address as part of its response to the draft determination.

5.10 In a letter dated 5 November 2007 the territorial authority agreed with the findings of the expert’s report and made no further comment on it.

## **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 Solutions<sup>4</sup>, which will assist in determining whether the features of these houses are code compliant. However, in making this comparison, the following general observations are valid:

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

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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).

- 6.1.2 The approach in determining whether building work is weathertight and durable and is likely to remain so, is to apply the principles of weathertightness. This involves the examination of the design of the building, the surrounding environment, the design features that are intended to prevent the penetration of water, the cladding system, its installation, and the moisture tolerance of the external framing. The Department and its antecedent, the Building Industry Authority, have also described weathertightness risk factors in previous determinations<sup>5</sup> (for example, Determination 2004/1) relating to cladding and these factors are also used in the evaluation process.
- 6.1.3 The consequences of a building demonstrating a high weathertightness risk is that the building solutions will need to be more robust to meet the requirements of the Building Code. 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 moderate wind zone
- is a maximum of two storeys high
- is fairly complex in plan and form
- has monolithic cladding that is fixed directly to the framing
- has eaves and verge projections from 250 mm to 500 mm above most walls
- has five decks with open timber balustrades (two 2-storey decks and an entry deck and ramp), four which have tiled floors
- has external wall framing that is not treated to a level that provides resistance to the onset of decay if the framing absorbs and retains moisture.

6.2.2 The house has been evaluated using the E2/AS1 risk matrix. The risk matrix facilitates the summation 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 risk ratings will necessitate more rigorous weatherproof detailing; for example, a high risk rating is likely to necessitate particular types of cladding being installed over a drained cavity.

6.2.3 When evaluated using the E2/AS1 risk matrix, the weathertightness features outlined in paragraph 6.2.1 show that three elevations of this house demonstrate a high weathertightness risk rating and one a moderate rating. I note that, in order to comply with E2/AS1, the monolithic cladding on this building would require 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. Discussion**

- 7.1 Taking into account the expert's report, I am satisfied that the current performance of the cladding installed on this house is inadequate because it has not been installed according to good trade practice. In particular, the cladding is at present allowing moisture penetration into the walls through defects in the cladding, which in turn may have led to decay of the untreated framing timber in some locations.
- 7.2 The cladding demonstrates the key defects listed in paragraph 5.7, and I have also identified the presence of a range of known weathertightness risk factors in this house. The presence of the risk factors on their own is not necessarily a concern, but they have to be considered in combination with the significant faults identified in the cladding system. It is that combination of risk factors and faults that indicate that the structure does not have sufficient provisions that would compensate for the lack of a drained and ventilated cavity. Consequently, I am not satisfied that the cladding system as installed complies with clause E2 of the Building Code.
- 7.3 In addition, the building 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 building are allowing moisture penetration in some locations now or are likely to allow the ingress of moisture in the future, the house does not comply with the durability requirements of clause B2.
- 7.4 I find that, because of the extent and apparent complexity of the faults that have been identified with the cladding, I am unable to conclude, with the information available to me, that fixing 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 specified 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 repair option should be submitted to the territorial authority for its consideration and approval.

## **8. The decision**

- 8.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the cladding 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 Rectify that also required the cladding to be removed and replaced. Under the Act, a notice to fix can require the owner to bring the additions into compliance with the Building Code. The Building Industry Authority has found in a previous Determination 2000/1 that a Notice to Rectify (the equivalent to a notice to fix under the Building Act 1991) cannot specify how that compliance can be achieved. I concur with that view.

- 8.3 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, identifying the defects listed in paragraph 5.7 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.
- 8.4 I would suggest that the parties adopt the following process to meet the requirements of paragraph 8.3. Initially, the territorial authority should issue the new notice to fix. The owner should then produce a response to this in the form of a detailed proposal, produced in conjunction with a competent and suitably qualified person, as to the rectification or otherwise of the specified issues. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 22 November 2007.

John Gardiner  
**Manager Determinations**