

## Determination 2007/7

### Refusal of a code compliance certificate for a building with a monolithic cladding system at 39 Admiral Court, Greenhithe, Auckland



#### 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 applicants are the owners, Mr and Mrs Howard (“the applicants”) and the other party is the North Shore City Council (“the territorial authority”).
- 1.2 The matter for determination is whether the territorial authority’s decision to decline to issue a code compliance certificate for a 4-year-old house is correct. The territorial authority declined the application because it was not satisfied that the monolithic cladding as installed to the walls of the house complied with clause B2 “Durability” and clause E2 “External Moisture” of the Building Code<sup>2</sup> (First

<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).

Schedule, Building Regulations 1992). By “the monolithic cladding as installed” I mean the components of the system (such as the backing materials, the flashings, the joints and the plaster and coatings) as well as the way the components have been installed and work together.

- 1.3 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.
- 1.4 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 a gently sloping site, which is in a medium wind zone for the purposes of NZS 3604<sup>3</sup>. The house is two storeys high in part, with single-storey ground floor projections to all elevations. Construction is conventional light timber frame, with a concrete slab, concrete block perimeter foundations, aluminium windows and monolithic wall cladding. The house shape is moderately complex in plan, with 27° pitch pressed metal tile hip roofs over upper and lower roofs, except for an upper roof gable to the south. Eaves projections are generally 450mm wide and verges are 300mm, except for several deeper recesses and part of the south elevation where there are no verge projections and the gutter is the only eaves projection. The northeast and northwest corners are angled to provide triangular roof overhangs that are supported by monolithic-clad columns.
- 2.2 An enclosed deck, situated above the living room, extends to the west from the upper floor bedroom. The deck is recessed within the lower roof, with the upper roof extending as a gable canopy over the deck area. Walls at the deck perimeter below the roof extension have curved-top openings from the deck, resulting in monolithic-clad corner support walls and balustrades with flat monolithic tops.
- 2.3 The expert has noted that he found no evidence of treatment on timber he was able to inspect. The specification calls for wall framing to comply with NZS 3640. At the time of construction, NZS 3602<sup>4</sup> (which NZS 3640 references) permitted the use of untreated timber, provided that timber could remain below 18% moisture content throughout its design life. Given the lack of evidence and the date of construction of the house, I consider that the external wall framing is unlikely to be treated.
- 2.4 The cladding system is what is described as monolithic cladding, which the expert describes as an “Eterpan” system, incorporating 7.5 mm thick fibre-cement sheets fixed through the building wrap to the framing, and finished with an applied textured plaster “Uniplast” system.

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

<sup>4</sup> New Zealand Standard NZS 3602:1995 Timber and Wood-based Products for Use in Buildings

- 2.5 I have received no evidence of producer statements or warranties for the cladding. However, the applicants state that among the documentation forwarded to the territorial authority were producer statements for both the “Eterpan” and the coating systems.

### **3. Sequence of events**

- 3.1 The territorial authority issued building consent number BB/01411/01 on 2 July 2001 to Lifestyle Construction Services Ltd. (“the developer”). I have received no evidence of inspections undertaken by the territorial authority during construction, but it seems that the work was completed by early 2002. It appears that the applicants purchased the house from the developer in November 2002 (apparently unaware that a code compliance certificate had not been issued).
- 3.2 In response to the applicants seeking a code compliance certificate in 2006, the territorial authority carried out a further visual “weathertightness” inspection of the house. In a letter to the applicants dated 6 July 2006, the territorial authority stated that the Building Code required the durability of the cladding to be 15 years and that of the timber framing to be 50 years, and also noted that the inspection process for monolithic claddings had changed since the time that the building consent for the house was processed. The territorial authority listed certain weathertightness risk factors identified with the building, together with defects and outstanding documentation, and stated that, due to these risk factors and defects, it could not be satisfied on reasonable grounds that the cladding system complied with clauses E2 and B2 of the Building Code.
- 3.3 The territorial authority did not issue a notice to fix as required under section 164(2) of the Building Act 2004.
- 3.4 On 24 August 2006, the Department received an application for a determination from the owners.

### **4. The submissions**

- 4.1 Within the application, the applicants noted that the matter for determination was the  
Compliance of the installed cladding system with the relevant clauses of the NZ Building Code.
- 4.2 The applicants forwarded copies of:
- the consent drawings and specification
  - the consent documentation
  - the correspondence with the territorial authority.

- 4.3 The territorial authority wrote to the Department on 12 October 2006, noting that the matter to be determined was “whether the installed wall cladding systems comply with clauses B2 and E2 of the Building Code”.
- 4.4 The territorial authority forwarded copies of:
- the building consent
  - some inspection reports
  - the correspondence with the applicants.
- 4.5 Copies of the submissions and other evidence were supplied to the parties
- 4.6 A copy of the draft determination was forwarded to the parties for comment on 30 November 2006. In a letter to the Department dated 2 December 2006, the applicants accepted the draft determination. However, the applicants noted that they had forwarded relevant documentation to the territorial authority and requested that paragraph 2.5 of the draft be amended accordingly. I have made that amendment.
- 4.7 The territorial authority stated responded to the draft determination on 14 December 2006. The territorial stated that the only document that it had received from the applicants was the D2 form, which had been forwarded to the Department on 11 October 2006. The territorial authority also noted that it had forwarded a submission dated 12 October 2006, which has been copied to the applicants.

## **5. The expert’s report**

- 5.1 As discussed in paragraph 1.3, I engaged an independent expert capable of providing an assessment of the code compliance of the matters in dispute. The expert is a member of the Institute of Building Surveyors. I acknowledge the expert considered his inspection incomplete only insofar as more moisture readings would have been taken had circumstances allowed. The expert took a limited number of moisture readings of the four elevations but sufficient in number to establish that moisture is entering the building and for me to make a decision in this instance.
- 5.2 The expert inspected the claddings of the building on 1 and 4 October 2006, and furnished a report that was completed on 4 October 2006. The expert noted that many details were “consistent with good trade practice”, with the finish of the textured coating appearing to be “done to a reasonable standard”. The expert noted that he was unable to carry out a full inspection of the roof, but the areas that he could see appeared to be satisfactory. The expert also noted that cladding clearances and base overlaps generally appeared adequate.
- 5.3 The expert noted that the windows were face-fixed with metal head flashings and no sill flashings. The expert scraped away small sections of coating at the jambs of two windows, and noted sealant behind the jamb flanges (in accordance with the manufacturer’s instructions at the time). I accept that these locations are typical of similar locations in the house.

5.4 The expert took non-invasive moisture readings through internal linings of exterior walls throughout the house, and noted several elevated readings. Invasive moisture readings were taken through the wall cladding, at window sills, bottom plates and other risky areas, and more than 15 elevated readings were noted including the following:

- 30% and 32% at the bottom of the monolithic-clad columns
- 24% to more than 40% in the framing at the top of the deck balustrade and at balustrade to wall junctions

#### **South elevation**

- 19% below the staircase window sill
- 23% in the bottom plate of the south wall of bedroom 3
- 40% below the window sill in the west return wall of bedroom 3
- 20% and 30% in the bottom plate in the west return wall of bedroom 3
- 24% to 25% in the west return wall of the garage
- 24% in the bottom plate of the east end of the south wall of the garage.

Moisture levels above 18% recorded after cladding is in place generally indicate that external moisture is entering the structure.

5.5 The expert made the following specific comments on the cladding:

- there are no vertical control joints in the west and south garage walls, where the cladding length exceeds the 5.4m limit between such joints recommended by the manufacturer
- there are several cracks in the cladding (including one in line with the window jambs, indicating that the backing sheet layout does not accord with the manufacturers instruction), and popped nailheads in some areas
- the bottom of the cladding to the columns is buried below ground level, and moisture is penetrating the column framing
- there are no drainage gaps at the window sill flanges, risking moisture being trapped within the framing
- the flat plastered tops of the deck balustrades are inadequately flashed at the tops and the junctions with the walls – and moisture is entering the framing
- a timber post, with unsealed fixings, is bolted against the south wall of the garage
- some other penetrations through the cladding are poorly sealed.

5.6 The expert made the following additional comments, noting that:

- although there are several locations on the north and east elevation where the clearance from the bottom of the cladding to the adjacent paving is less than that called for in E2/AS1, these areas are well drained and sheltered with no indication of associated moisture entry
- although the meterbox lacks a head flashing, it is well-sealed and protected under the eaves
- although the deck overflow is under-sized, the deck is fully protected by the projected roof above
- although the garage door lacks a head flashing, the door head is sheltered under the eaves and there is no indication of moisture entry.

5.7 A copy of the expert's report was provided to each of the parties on 4 October 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>5</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 risk factors in previous determinations<sup>6</sup> (refer to Determination 2004/1 *et al*) 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.

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<sup>5</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).

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

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 medium wind zone
- is a maximum of two storeys high
- is fairly complex in plan and form
- has a deck under a roof projection, which is recessed into a lower roof
- has eaves of 450mm and verge projections of 300mm over most walls
- has monolithic cladding that is fixed directly to the framing
- has external wall framing that is not treated to a level that will provide resistance to the onset of decay if the framing absorbs and retains moisture.

6.2.2 When evaluated using the E2/AS1 risk matrix, all elevations of this house demonstrate a high 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.

## **6.3 Weathertightness performance**

6.3.1 Generally the cladding appears to have been installed in accordance with good trade practice. However, some junctions, edges and penetrations are not well constructed, and these are as described in paragraph 5.5, and in the expert's report.

6.3.2 I also note the high moisture levels recorded in the garage and bedroom 3 walls on the south elevation, and consider that the cause of the moisture penetration into this section of wall cannot be determined from the evidence available to me. I therefore consider that further investigation is required (including the removal of cladding as necessary) in order to identify the defects leading to this moisture penetration.

6.3.3 I also note the expert's comments in paragraph 5.6, and accept that these areas are adequate under the particular circumstances described.

6.3.4 Notwithstanding the fact that the cladding is fixed directly to the timber framing, thus limiting drainage and ventilation behind the cladding, I have noted certain compensating factors that assist the performance of the cladding in this particular case:

- Apart from the noted exceptions the cladding is installed to good trade practice.
- The house has eaves and verge projections over most walls, which provide reasonable protection to the cladding below them.
- The upper deck is well protected by the roof extension above.

6.3.5 I consider that these factors help compensate for the lack of a ventilated cavity and can assist the building to comply with the weathertightness and durability provisions of the Building Code.

## **7. Discussion**

7.1 I am satisfied that the current performance of the monolithic cladding is not adequate because it is allowing water penetration into the building at present. Consequently, I am not satisfied that the cladding system as installed on the building complies with clause E2 of the Building Code.

7.2 In addition, the house 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 likely to allow the ingress of moisture in the future, the house does not comply with the durability requirements of clause B2.

7.3 I also find that rectification of the items and matters outlined in paragraphs 5.5 and 6.3.2, to the approval of the territorial authority, along with any other faults that may become apparent in the course of that work, will consequently result in the house remaining weathertight and in compliance with clauses B2 and E2.

7.4 It is emphasized that each determination is conducted on a case-by-case basis. Accordingly, the fact that a particular cladding system has been established as being code compliant in relation to a particular building does not necessarily mean that the same cladding system will be code compliant in another situation.

7.5 I decline to incorporate any waiver or modification of the Building Code in this determination.

7.6 Effective maintenance of claddings (in particular of monolithic claddings) is important to ensure ongoing compliance with clauses B2 and E2 of the Building Code and is the responsibility of the building owner. Clause B2.3.1 of the Building Code requires that the cladding be subject to "normal maintenance", however that term is not defined in the Act.

7.7 I take the view that normal maintenance is that work generally recognised as necessary to achieve the expected durability for a given building element. With respect to the cladding, the extent and nature of the maintenance will depend on the material, or system, its geographical location and level of exposure. Following regular inspection, normal maintenance tasks should include but not be limited to:



- where applicable, following manufacturers' maintenance recommendations
- washing down surfaces, particularly those subject to wind-driven salt spray
- re-coating protective finishes
- replacing sealant, seals and gaskets in joints.

7.8 As the external wall framing of this house is not treated to a level that will resist the onset of decay if it gets wet, periodic checking of its moisture content should also be carried out as part of normal maintenance.

## **8. The decision**

8.1 In accordance with section 188 of the Building Act 2004, 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 not issued a Notice to Rectify or a notice to fix. The territorial authority should now issue a notice to fix, and the applicant is then obliged to bring the building up to compliance with the Building Code. It is not for me to decide directly how the defects are to be remedied and the cladding brought to compliance with the Building Code. That is a matter for the applicants to propose and for the territorial authority to accept or reject.

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 a 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 23 January 2007.

John Gardiner  
**Determinations Manager**