

## Determination 2006/95

### Refusal of a code compliance certificate for additions to a house that has a monolithic and weatherboard cladding systems at 43 Palliser Lane, Browns Bay, North Shore City



#### 1 The dispute 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, for and on behalf of the Chief Executive of that Department. The applicants are the owners, Glenn Schmidt and Katrina Mora (“the applicants”), and the other party is the North Shore City Council (“the territorial authority”). The application arises because the territorial authority declines to issue a code compliance certificate for a house, as it is not satisfied on reasonable grounds that its cladding systems are code compliant.
- 1.2 The dispute for determination is whether I am satisfied on reasonable grounds that the territorial authority’s decision to decline to issue a code compliance certificate for

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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).

a 4-year-old house is correct. The territorial authority declined the application because it was not satisfied that the monolithic and weatherboard cladding systems as installed on the building work complied with clauses B2 “Durability” and E2 “External Moisture” of the Building Code<sup>2</sup> (First 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/or the 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.

## 2 The building

- 2.1 The building work involves a two-storey house with a basement garage situated on an excavated sloping site that is in a low wind zone in terms of NZS 3604<sup>3</sup>. The house is of a relatively simple shape on plan but with some complex features. The external walls are conventional timber framing built on timber framed floors. The steeply pitched roofs, which are at two main levels, have hip, valley, and wall-to-roof junctions. Apart from one short length with a 1200mm wide projection, the eaves projections are 300mm wide, plus the width of the gutters. The roof also extends over the lower level balcony, where it is supported on monolithic-clad timber posts.
- 2.2 The house has a mid-floor timber-framed balcony situated outside the dining and living rooms and this, apart from a narrow segmental shaped cantilevered section, is constructed over the garage. The balcony has a monolithic-clad timber-framed balustrade that is topped by a metal handrail fixed through the sides of the balustrades of its straight sections. A mid-floor timber-framed close-boarded deck supported on timber posts and beams is constructed around two elevations outside the lounge. The deck has a monolithic-clad timber-framed balustrade. A small deck and a set of adjoining steps are situated outside the main entry and have a balustrade that matches that for the balcony.
- 2.3 The applicants have stated that the external wall framing is untreated apart from the bottom plates, which are H3 treated. The expert took a sample from a balustrade wall, which was then tested by a laboratory. The laboratory confirmed that the bottom plate was H3 treated. Accordingly, based on this evidence, I accept that, apart from the bottom plates and balustrade framing, the balance of the external wall framing is unlikely to be treated to a level that is effective in helping resist decay if it absorbs and retains moisture.
- 2.4 The majority of the wall cladding to the timber-framed walls is a monolithic cladding system consisting of CSR 7.5mm thick fibre-cement backing sheets fixed through the building wrap directly to the framing timbers. The backing sheets are finished with a painted textured plaster system. The balance of the cladding consists of painted “Linear” fibre-cement weatherboards.

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

<sup>3</sup> New Zealand Standard NZS 3604: 1999 Timber framed buildings.

### **3 Sequence of events**

- 3.1 The territorial authority issued a building consent in October 2002.
- 3.2 The territorial authority carried out various inspections during construction, undertaking a final inspection on 21 March 2005.
- 3.3 The territorial authority wrote to the applicants on 20 June 2005 advising that a code compliance certificate would not be issued. It also noted that detailed inspections of face-fixed monolithic cladding systems were now more rigorous. In relation to the cladding, the territorial authority also described:
- risk factors
  - a list of identified defects
  - other requirements for compliance.
- 3.4 Following this letter, the territorial authority carried out a final “recheck” inspection on 10 August 2005. The “Inspection Record” relating to this inspection noted that the question of the external cladding was “to be resolved”.
- 3.5 The territorial authority did not issue a notice to fix as required under section 164 of the Act.
- 3.6 The application for determination was received on 14 June 2006.

### **4 The submissions**

- 4.1 In a covering letter to the Department dated 23 April 2006, the applicants stated that they had employed an experienced designer, had consulted directly with the territorial authority about face-fixing and cavity systems and during the inspection process, and had consulted the timber supplier about timber treatment levels. According to the applicants, the territorial authority had given advice that a cavity system was not required and had passed the plans showing directly fixed cladding. The applicants described their own experiences with similar type clad buildings and noted that the territorial authority was refusing to issue a code compliance certificate as it was not sure that the house complied with the Building Code. The territorial authority had declined to accept any moisture testing of the house. The applicants stated that so far, the house was not showing any signs of movement, cracking or water ingress.
- 4.2 The applicants forwarded copies of:
- the plans and specifications
  - the statement from the timber supplier as to the timber treatment used on the wall framing
  - the territorial authority’s “Inspection Record”
  - the letter from the territorial authority dated 20 June 2006

- some of the cladding manufacturer's details.

4.3 Copies of the submissions and other evidence were provided to each of the parties.

4.4 A copy of the draft determination was sent to the parties on 30 August 2006.

4.5 In a fax to the Department dated 15 September 2006, the territorial authority accepted the draft subject to a correction of the date of the final "recheck" inspection.

4.6 The applicants responded to the draft in a letter to the Department dated 5 September 2006. The applicants described various construction details pertaining to the building and were also of the opinion that the house is in a "low" wind zone. In particular the applicants made the following comments on the expert's observations:

- Most of the readings over 18% were located in areas where the framing is H3 treated.
- The boundary joist of the lounge floor forms a drip edge and the joists are lined with "Hardiflex".
- The sub-floor door is in the base cladding that is clad on one side only and is ventilated by adjoining base vents.
- The untidy jointer is installed correctly.
- The decayed building paper is on the H3 treated balustrade framing, which is clad on one side only and is well ventilated.
- Cap flashings were not required under the consent and the cap framing is protected by a waterproof membrane.
- There are two deck overflows that are well below the floor level.

I have considered these comments and amended the determination as appropriate.

## **5 The expert's report**

5.1 The expert inspected the cladding of the building on 27 July 2006 and furnished a report that was completed on 7 August 2006. The expert was of the opinion that, apart from the listed issues (see paragraph 5.4), the monolithic cladding system appears to be "fitted and coated to a generally good standard". The expert noted that two walls were marginally over the length that requires a vertical control joint to be inserted.

5.2 The expert removed areas of the plaster to examine the construction. I am prepared to accept that these examples are representative and apply to similar details throughout the additions. The expert was of the opinion that the exterior joinery units are adequately sealed and flashed. The expert also removed a small section of the timber wall framing at the balcony balustrade and forwarded it to a testing laboratory for analysis.

5.3 The expert took non-invasive moisture readings through the interior linings of the exterior walls and no higher readings were recorded. The expert then took invasive moisture readings into the exterior of the wall framing, and recorded the following higher readings:

- 20%, 22%, 23%, 24% (at 2 locations), 28%, and 30% at the north elevation
- 20% and 21% at the south elevation
- 20% and 26% at the east elevation.

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

5.4 The expert made the following comments regarding the monolithic cladding:

- There is some fine cracking at some locations which may have arisen from the use of a paint colour with low reflectance.
- There are no control joints to two walls over 5.4 metres long.
- A small amount of cladding is in contact with the ground at the front entry stairs.
- There is no cladding overlap provided at the deck-to-wall junction of the lounge deck.
- The barrier wall cladding adjoining the lounge deck joists lacks a drip projection.
- The corner flashing between the two kitchen windows is not fully effective.
- The ends of two wall-to-roof flashings are not adequately constructed.
- The sub-floor door situated on the west elevation lacks a fitted frame and flashings.
- There is an untidy jointer detail to the entry balustrade below the lounge room deck.
- The building paper under the basement cladding is wet and decaying.
- The balcony and deck balustrades lack cap flashings.
- The deck barrier bottom plate at the west elevation is in contact with the ground.
- There is an inadequate drainage pathway to the overflow drainage pipe at the east end of the deck.
- The discharge through the family room deck overflow pipe is passing into the cladding.

5.5 The expert also noted that a ridge tile on the front north elevation could eventually pierce the adjoining butyl-rubber membrane.

5.6 Copies of the expert's report were provided to each of the parties on 11 August 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 named features of this building 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.

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 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>5</sup> 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 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.

### 6.2 Weathertightness risk

6.2.1 In relation to the weathertightness characteristics, I find that the house:

- is situated in a low wind zone
- is a maximum of three storeys high and is of a relatively simple shape on plan but with some complex features
- generally has 300mm wide eaves projections plus the gutter width, which together with the two roof overhangs, provide some protection to the cladding beneath them
- has one balcony, which is partially constructed over the garage space, and one deck
- has external wall framing, the majority of which is unlikely to be treated to a level that is effective in helping resist decay if it absorbs and retains moisture.

<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).

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

6.2.2 When evaluated using the E2/AS1 risk matrix, these weathertight features show that three elevations of the building demonstrate a high weathertightness risk rating and one elevation a low rating. The matrix is an assessment tool that is intended to be used at the time of application for consent, before the 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 paragraphs 5.4 and 5.5, and in the expert's report.

6.3.2 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 is situated in a low wind zone.
- The house has eaves and roof projections that provide some protection to the wall cladding areas below them.

6.3.3 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 several locations 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 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 additions to remain weathertight. Because the cladding faults on the additions are likely to allow the ingress of moisture in the future, the additions do not comply with the durability requirements of clause B2.

7.3 Subject to further investigations that may identify other faults, I consider that, because the faults identified with the cladding system occur in discrete areas, I can conclude that satisfactory rectification of the items outlined in paragraphs 5.4 and 5.5 will result in the building remaining weathertight and in compliance with clauses B2 and E2.

- 7.4 The expert noted that there are two walls that exceed the 5400mm horizontal limit recommended by the cladding manufacturer between vertical control joints. Both these walls are 6000mm long, and considering the location and the rigidity of the support, I accept, in this particular case, that this additional 600mm length is not crucial when considering control joints.
- 7.5 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.
- 7.6 I decline to incorporate any waiver or modification of the Building Code in this determination.

## 8 Conclusion

- 8.1 I find that the cladding system as installed on the house does not comply with clauses B2 and E2 of the Building Code.
- 8.2 I also find that rectification of the items outlined in paragraphs 5.4 and 5.5 (and taking account of the applicants' comments in paragraph 4.6) will consequently result in the house remaining weathertight and in compliance with clauses B2 and E2. Work to correct these items may expose additional associated defects not yet apparent. All rectification work is to be completed to the approval of the territorial authority.
- 8.3 Effective maintenance of claddings (in particular monolithic cladding) 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.
- 8.4 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.
- 8.5 As the majority of the external wall framing of the building 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.
- 8.6 I note that the cladding is finished in a colour with a low reflectance that may lead to excessive thermal movement causing cracking. The cladding should be monitored as

part of normal maintenance so that any such cracking is promptly detected and remedied.

## **9 The Decision**

- 9.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the monolithic 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.
- 9.2 I note that the territorial authority has not issued a Notice to Rectify or a notice to fix. A notice to fix should be issued requiring the owners to bring the house into compliance with the Building Code. The notice to fix may list the items to be rectified but it should not specify how compliance is to be achieved as this is for the owners 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.
- 9.3 I would suggest that the parties adopt the following process to meet the requirements of clause 9.2. Initially, the territorial authority should issue the notice to fix, listing all the items that the territorial authority considers to be non-compliant. The applicants should then produce a response to this in the form of a technically robust proposal, 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.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 25 September 2006.

John Gardiner  
**Determinations Manager**