

## Determination 2006/64

### Refusal of a code compliance certificate for a building with a “monolithic” cladding system at 79 Kowhai Road, Mairangi Bay, North Shore City



#### 1 The dispute to be determined

- 1.1 This is a determination of a dispute under Part 3 Subpart 1 of the Building Act<sup>1</sup> 2004 (“the Act”) made under authorisation by me, John Gardiner, Determinations Manager, Department of Building and Housing, for and on behalf of the Chief Executive of that Department. The applicant is the North Shore City Council (“the territorial authority”) and the other party is the owner, Mr M Olesen (“the owner”).
- 1.2 The dispute for determination is whether I am satisfied on reasonable grounds that:

##### **Issue 1: The cladding**

The territorial authority’s decision to decline to issue a code compliance certificate on a 6-year-old alteration to an existing house was correct. The territorial authority declined the application because it was not satisfied that the monolithic cladding as installed on the building complied with clauses B2 “Durability” and E2 “External Moisture” of the Building Code<sup>2</sup> (First Schedule, Building Regulations 1992).

##### **Issue 2: The additional durability considerations**

All other elements incorporated in this building comply with clause B2 of the Building Code, considering the time the house was constructed.

<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 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.
- 1.4 I have not considered any other aspects of the Act or the Building Code.

## 2 Procedure

### 2.1 The building

- 2.1.1 The building work consists of extensive alterations to an existing house situated on a level site, which is in a low wind zone in terms of NZS 3604<sup>3</sup>. The resultant split-level house is a maximum of three storeys high. The new and existing external walls are conventional timber framing built on either concrete ground floor slabs or timber framed floors. The house shape is of a relatively complex form with pitched roofs at several levels that have hip, valley, and wall-to-roof junctions. The gable ends are formed with narrow parapet walls and the majority of the main roof eaves projections are 160mm wide. The eaves to the tower roof are 400mm wide. The external walls are clad with two types of cladding. The upper-floor tower is clad with timber vertical boards and battens and the remainder of the walls are clad with 40mm thick Plaster Systems Ltd “Insulclad” polystyrene cladding.
- 2.1.2 A bay window extends from the lounge and this has a flat roof constructed over it. Two separate timber-framed balconies are situated at the first floor level, each of which has a curved outer perimeter. One balcony is cantilevered out from the face of the building and the other is supported on monolithic-clad timber-framed beams and two similarly constructed columns, which are extended up to form baluster columns. A metal balustrade protects each balcony. A full-height monolithic-clad timber-framed chimney is constructed against one external wall.
- 2.1.3 The applicant provided the expert with an invoice showing that a quantity of 90mm x 47mm H1.2 Boric Treated No 2 M/G timber was delivered to the site.
- 2.1.4 The cladding system to the majority of the external walls and to the new columns and beams of the house is what is described as monolithic cladding. This cladding consists of 40mm thick “Insulclad” polystyrene panels fixed directly to the framing over the non-absorbent synthetic building wrap. The walls and the parapet claddings are finished with a 3-6mm thick Plaster Systems Ltd textured coating. The upper-level tower external walls are clad with timber vertical boards and battens. According to the expert, Protex Coating Systems Ltd who applied the plaster system was not, nor had been, a Plaster Systems licensed practitioner.
- 2.1.5 Plaster Systems Ltd issued a producer statement dated 9 November 2005 for the materials and installation of the “Insulclad” system applied to the house. They also issued a 15-year “Material Components Guarantee” dated 14 March 2005 in respect of the plaster system. The plastering contractor issued a 5-year “Workmanship

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

Guarantee” also dated 14 March 2005 in respect of the plasterwork. Both of these guarantees excluded damage associated with untreated timber, defective building structure, hydrostatic pressure, mechanical or physical abuse or any other abnormal cause.

2.1.6 As described by the expert, there is nothing on the plans and specifications provided by the applicant to indicate certain major elements present in the completed building. These include the:

- new blockwork perimeter walls
- rebuilding the entry porch floor
- replacement of the existing timber windows with new aluminium windows
- replacement of the existing weatherboards with “Insulclad” cladding
- new lower roof structure.

I have not received any information as to whether the original building consent has been amended to reflect some or all of these apparent variations from the consent drawings.

### **3 Sequence of events**

- 3.1 The territorial authority issued a building consent on 16 March 1999 and the construction occurred over a period from April 1999 to December 2001.
- 3.2 During this time the territorial authority undertook regular inspections although there were no specific cladding inspections carried out. A specific weathertightness inspection was however carried out on 8 November 2005.
- 3.3 A final inspection carried out in 1 November 2005, noted a number of items for attention, and these were confirmed as completed by an inspection on 3 December 2005.
- 3.4 On 3 December 2005 the territorial authority advised the applicant that a code compliance certificate would not be issued.
- 3.5 The applicant’s application for a determination was dated 12 December 2005.

## 4 The submissions

4.1 Under the “matter of doubt or dispute” the applicants noted the matters of doubt or dispute are:

- Whether the installed cladding systems comply with the relevant clauses of the New Zealand Building Code.
- Whether the other building elements incorporated in this building comply with clause B2 of the building code considering the age of construction.

4.2 The applicants also supplied copies of the:

- building plans
- BRANZ Appraisal Certificate for the cladding
- various producer statements.

4.3 The territorial authority made a submission dated 28 February 2006 which included

- territorial authority correspondence, including a short summary of events
- matters of doubt being compliance with clauses E2 and B2 of the building code
- building consent documents
- territorial authority inspection records.

4.4 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.

4.5 A draft determination was issued to the parties for comment on 10 May 2006. The applicant accepted the draft.

4.6 The territorial authority accepted the draft but in a submission to the Department dated 24 May 2006 said:

- The determination did not address the second matter listed in paragraph 4.1
- The fixings to the decorative copper chimney trim were dependent on sealant for weathertightness
- The overflows to the internal gutters to the master bedroom dormer roof were too small.

I have amended the determination to respond to these comments as appropriate.

## 5 The expert's report

- 5.1 The expert inspected the claddings of the building on 25 February 2006 and furnished a report that was completed on 26 February 2006. The expert noted that the interior work undertaken on the house is to an exceptionally high standard and that the final sponge finished final plaster coating is of a reasonable standard. The expert considered that no control joints were necessary in the monolithic cladding for a building with the dimensions of the house in question.
- 5.2 The expert cut away small sections of the coating to expose typical window jamb and sill junctions of a window, and the inspections revealed that appropriate sill and jamb flashings are installed. I accept that the details revealed by this inspection are typical of similar locations around the building.
- 5.3 The expert took non-invasive moisture readings and apart from one location, all the readings were between 10% and 16%. The high reading was taken at an isolated area of the internal corner of the garage. 4 further invasive moisture readings were taken through the cladding at the parapet walls where higher non-invasive readings had been recorded. Readings of 10%, 12%, 16%, and 18% were noted. Invasive readings at the balconies gave a reading of 19% at the cladding adjoining the cantilevered balcony, and readings of 24% and 40% (at two locations) at the front entry balcony deck soffit.
- 5.4 Moisture levels above 18% recorded after cladding is in place generally indicate that external moisture is entering the structure. However, as noted by the expert the investigation was carried out during a long dry period and therefore the higher readings could indicate that moisture is reaching the framing at these locations.
- 5.5 The expert found evidence of soft brown wet timber in the garage area and subsequently cut away a section of the internal lining in the garage and later an area of the external cladding at the parapet wall above this location. The cut-out revealed that there was no building wrap or butyl- rubber flashing installed, that the polystyrene to the sloping parapet top was fixed directly to the framing, and that the timber framing was rotten. The expert was of the opinion that the leakage to this location could be due to a defective apron flashing but noted that further invasive inspections were required to confirm this opinion. I strongly recommend that the other parapet details should also be reviewed in conjunction with the territorial authority to ensure that the problems evident in this particular location are not present elsewhere.
- 5.6 The expert made the following specific comments on the monolithic cladding.
- the cladding on either side of the front door has inadequate ground clearance at its base, however, the expert noted that the sealed junction at this location is currently effective
  - the step at the garage door is minimal, however, as the concrete driveway has been cut away at the ends of the step, the cladding can freely drain

- standard jamb flashings are installed to the heads of the exterior joinery units and no corner soakers are installed to the ends of these flashings. This non standard detail appears to have performed to date but a drip edge will be required to be formed in the plaster across the window heads to prevent moisture regularly reaching the head jamb flashing joins
- the cladding and joinery are finished hard onto the cantilevered balcony deck tiles.
- there is a crack between the top of the cladding and the deck tiles of the front entry balcony
- there is no drip edge formed on the cladding where it adjoins the decks of both balconies and the edges of the deck membrane are inadequately finished
- the metal balcony balustrade balusters are not fixed through the tiles and membrane of both balcony decks
- The end of the apron flashing to the garage parapet wall is ineffectively finished.

5.7 The expert also noted the lack of gutters to the tower roof, to the large dormer and to the roof above the bedroom. In addition, the expert was of the opinion that the internal gutters either side of the large dormer require frequent cleaning to avoid leaf blockage.

5.8 A copy of the expert's report was provided to each of the parties on 1 March 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 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.

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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 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 considered 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 building:

- is situated in a low wind zone
- has only minimal eaves projections to protect the cladding
- is of a relatively complex shape on plan
- has two external balconies, one of which is cantilevered
- has external framing timber, which in at least one area has not proved to be resistant to decay once it became wet.

6.2.2 When evaluated using the E2/AS1 risk matrix, these weathertight features show that all elevations of the building 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 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.

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

### 6.3 Weathertightness performance

6.3.1 Generally the cladding appears to have been installed according to good trade practice, but a large number of junctions, edges and penetrations are not well constructed. These areas are all as described in paragraph 5.6 and in the expert's report as being:

- the cladding on either side of the front door having inadequate ground clearance at its base
- standard jamb flashings being installed to the heads of the exterior joinery units and the lack of corner soakers which will require drip edges to be formed along the top edge of the plaster above the windows
- the cladding and joinery finishing hard onto the cantilevered balcony deck tiles
- the crack between the top of the cladding and the deck tiles of the front entry balcony
- the lack of a drip edge formed on the cladding where it adjoins the decks of both balconies, and the inadequately finished edges of the deck membrane
- the metal balcony balustrade balusters not being fixed through the tiles and membrane of both balcony decks
- The ineffectively finished end of the apron flashing to the garage parapet wall.

6.3.2 Notwithstanding the fact that the backing sheets are fixed directly to the timber framing or on non-draining horizontal battens, thus limiting drainage and ventilation behind the cladding sheets, I have noted certain compensating factors that assist the performance of the cladding in this particular case:

- the cladding generally appears to have been installed to good trade practice
- the house is situated in a low wind zone.

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

6.3.4 I am of the view that the minimal step at the garage door is acceptable due to the free-draining capabilities provided by the cut away concrete driveway at the ends of the step.

6.3.5 I also draw the territorial authority's attention to the issues relating to amendments to the building work from that shown on the consented plans and as discussed in paragraph 2.6, and the issues raised by the expert pertaining to the lack of some roof gutters. There is also concern about the high moisture readings at or adjacent to the balconies. I strongly suggest that the territorial authority investigate all these



elements together with any other anomalies that it discovers, and take appropriate action to ensure their compliance and continuing structural integrity.

- 6.3.6 The territorial authority has submitted that the fixing of the copper decorative trim to the top of the chimney were dependent on sealant to achieve compliance. The chimney top has a very small catchment area and the interior of the chimney framing is accessible for inspection. I do not consider this situation poses a risk that requires specific attention or comment.
- 6.3.7 The territorial authority has submitted that the overflows to gutters either side of the master bedroom dormer roof are too small; a matter that was also noted in the expert's report. The expert believed the overflows were correctly placed to give an early warning to the usual outlets were blocked but that they were too small given the close proximity of a large tree. I consider the inspection of the gutters a matter for normal routine maintenance.

## 7 Conclusion

- 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 house to remain weathertight. Because the cladding faults on the building have already allowed the ingress of water, or will allow the ingress of moisture in the future, the house does 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 paragraph 6.3.1 and 6.3.5 is likely to result in the building being weathertight and in compliance with clauses B2 and E2.
- 7.4 Effective maintenance of claddings (in particular of 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.
- 7.5 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 shall 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.

7.6 As the external wall framing likely to be treated to a level insufficient to resist fungal decay, periodic checking of its moisture content should also be carried out as part of normal maintenance.

7.7 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.

## **Issue 1: The cladding**

### **8 The decision**

8.1 In accordance with section 188 of the Act, I hereby determine that the cladding system as installed on the building does not comply with clause E2 of the Building Code. There are also a number of items to be remedied to ensure that it remains weathertight and thus meet the durability requirement of the code. Consequently, I find that the external walls of the building do not comply with clause B2. Accordingly, I confirm the territorial authority's decision to refuse to issue a code compliance certificate.

8.2 I also find that rectification of the items outlined in paragraphs 6.3.1 and 6.3.5 will consequently result in the house being 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 I note that the territorial authority has issued a notice to fix [that also required provision for adequate ventilation, drainage and vapour dissipation]. Under the Act, a notice to fix can require the owner to bring the house into compliance with the Building Code. A new 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 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.

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 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 technically robust

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.

## **Issue 2: The additional durability considerations**

### **9 Discussion**

- 9.1 I note that 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 “from the time of issue of the applicable code compliance certificate”.
- 9.2 As set out in paragraph 4.1, the territorial authority has concerns about the durability, and hence the compliance with the Building Code, of certain elements of the house, taking into account the completion of the building in around December 2001. In the draft determination sent to the parties in May 2006 I made an interim decision on the matter of the durability by determining that there be a waiver or modification of the Building Code requirements relating to durability. Since then, I have received some general legal advice on waivers and modifications. As this advice is not clear, I subsequently have sought clarification of some aspects of that advice.
- 9.3 Until I receive the clarification will I suspend making a decision about the additional durability considerations. This will enable me to now determine matters related to the compliance of the cladding so that the steps outlined in paragraph 8.4 can commence. I will issue a second determination limited to the durability considerations as soon as possible.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 30 June 2006.

John Gardiner  
**Determinations Manager**