

# Determination 1578

1 May 2006

## Refusal of a code compliance certificate for a building with a “monolithic” cladding system at 25A Hyde Road, Rothesay 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 applicant is the owner Mr S C Coyle (“the applicant”) and the other party is the North Shore City Council (“the territorial authority”).
- 1.2 The dispute for determination is whether the territorial authority’s decision to decline to issue a code compliance certificate for a 6-year-old house because it was not satisfied that the monolithic cladding complied with clauses B2 “Durability” and E2 “External Moisture” of the Building Code<sup>2</sup> (First Schedule, Building Regulations 1992) is correct.
- 1.3 The questions to be determined, therefore, are whether I am satisfied on reasonable grounds that:
- (1) the monolithic wall cladding as installed to the external walls and columns of the building (“the cladding”), complies with the Building Code (see

<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)

sections 177 and 188 of the Act). By “the monolithic cladding as installed” I mean the components of the system (such as the backing sheets, the flashings, the joints and the plaster and/or the coatings) as well as the way the components have been installed and work together.

- (2) all other elements incorporated in this building comply with clause B2 of the Building Code, considering the time when the house was constructed.

1.4 In making my decision, I have considered the submissions of the parties, the report of the independent expert commissioned by the Department to advise on this dispute (“the expert”), and the other evidence in this matter. I have evaluated this information using a framework that I describe more fully in paragraph 6.1. I have not considered any other aspects of the Act or the Building Code.

## 2 The building

2.1 The building work consists of a large two-storey house with an extensive basement situated on an excavated sloping site, which is in a medium wind zone in terms of NZS 3604<sup>3</sup> The external walls above the basement are of conventional timber framing built on either concrete suspended slabs or timber framed floors and are clad in monolithic cladding. The house shape is of a complex form as are the low-pitched butyl-rubber clad roofs and internal gutters at two levels, which generally have 800mm wide reversed slope eaves projections. However, there are sections of the roofs that lack projections. There are also small cantilevered building projections and isolated flat roof areas at the upper levels.

2.2 The house has large balconies at each of the three main levels, one of which is situated over a small area of living space. Two of the balconies have circular profiles and they all have metal balustrades. The balconies are supported on columns that extend up to the roof-line. One column is plastered polystyrene and the remainder are of concrete blockwork that is strapped and monolithic clad. Timber-framed pergolas are situated at two elevations of the house and are supported by the columns. Two full-height timber-framed and monolithic-clad chimneys are constructed on the external walls of the house and are set into the high-level roofs.

2.3 While the applicant is of the opinion that it was H1 Boron treated, I have not received any other evidence as to the treatment, if any, applied to the external wall framing. The independent expert commissioned by the Department to inspect the house (“the expert”) found evidence of decaying timber during the inspection of the cladding, indicating that if the timber had been treated, the treatment was not to a level sufficient to resist decay.

2.4 The cladding system to the external walls and columns the house is what is described as monolithic cladding. The cladding consists of 7.5mm thick fibre-cement “Eterpan” sheets fixed directly to the framing finished with a 3 to 6mm thick textured coating and a further paint finish. I note that the cladding is shown on the existing plans as being “21mm coloured plaster on Hardibacker”. The territorial

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

authority has made reference to this change in its “Weathertightness Report” of 23 November 2003.

### **3 Sequence of events**

- 3.1 The territorial authority issued a building consent on 17 September 1998. The consent noted that the territorial authority required a minimum of one working day’s notice prior to certain inspections, including those for pre-lining, post-lining and pre-solid plastering.
- 3.2 The territorial authority carried out various inspections during the construction process and approved the external elements of the final checklist on 25 May 2001. The territorial authority carried out a specific weathertightness visual inspection of the property on 23 November 2004.
- 3.3 In a letter to the applicant dated 18 January 2005, 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. The territorial authority 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 a list of defects and other requirements for compliance. It also stated that, due to the uncertainties, 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.
- 3.4 The territorial authority did not issue a notice to fix as required under section 164 of the Act.
- 3.5 The applicant applied for a Determination on 3 October 2005.

### **4 The submissions**

- 4.1 In a covering letter to the Department dated 4 November 2005, the territorial authority set out a short summary of events and noted that the matters of doubt are:
- Whether the installed cladding system complies with clauses Building 2.3.1 and E2.3.2 of the Building Code.
- Whether all other building elements incorporated in this building, comply with clause Building 2 of the Building Code, considering the age of construction.
- 4.2 The territorial authority supplied copies of the:
- consent documentation
  - inspection records
  - letter to the applicant of 18 January 2005.

- 4.3 In a letter to the Department dated 3 October 2005, the applicant stated that the house was built over a period of 16 months between 1998 and 1999. The applicant described the cladding applied to the house and noted that a cavity was not required at the time the building consent was issued. The applicant was unable to provide receipts or invoices pertaining to the timber framing but sincerely believed that Boric treated timber was used. Minor issues raised by the territorial authority would be attended to and the whole building would be repainted. The house was not leaking and extreme measures were undertaken to ensure a high standard of finish and to guarantee a waterproof home.
- 4.4 In a further letter to the Department, which was received on 25 November 2005, the applicant stated that he was unable to locate any warranties relating to the cladding or any timber invoices. The house was constructed from November 1998 through to April 2000. The applicant described the supplier of the “Eterpan” sheets and the applicators who had assisted the applicant in fitting the cladding. In the opinion of the applicant, the applicators were not accredited installers of the product.
- 4.5 The applicant supplied copies of:
- the building plans
  - the letter from the territorial authority of 18 January 2005
  - an “Eterpan 430” data sheet.
- 4.6 The draft determination was issued to the parties for comment on 7 March 2006. The territorial authority accepted the draft.
- 4.7 The applicant accepted the draft on 24 April 2006 but made the following statements:
- With reference to paragraph 2.3 - “Some framing has been exposed internally, and the applicant is able to confirm that the framing is all ‘H1’ treated”.
  - With reference to paragraphs 5.2 and 6.3.1 - “The applicant suggested to the expert that a sufficient number of indicative readings had been obtained, and that and that there was little to be gained from further tests.”
  - With reference to paragraphs 5.4 and 6.3.2 - “The applicant confirms that the two internal columns were decorative only, and not structural.”

## **Issue 1: The cladding**

### **5 The expert’s report**

- 5.1 The expert inspected the claddings of the building on 12 December 2005 and furnished a report that was completed on 14 December 2005. The expert noted that the final coat of the textured finish is applied to a reasonable standard. While the exterior joinery units are carefully installed, “the exceptional conditions created by the combination of size, location and dark colour have placed unforeseen demands

on the installation”. The expert removed a portion of the textured finish at two window jambs and at a roof membrane and cladding junction. I accept that the locations opened are typical of similar locations around the building.

5.2 The expert took non-invasive moisture readings through the internal linings of the external walls and elevated readings were obtained “in quite a few areas”. Very high non-invasive readings were also obtained under the junction of the main chimney and the roof. A further 23 invasive readings in the framing were taken at some of these locations but according to the expert, the applicant requested that the expert stop testing the remaining areas of concern. The following are the elevated readings that the expert was able to obtain:

- readings of 19%, 21%, 24%, 30% (at 2 locations), 32% (at 2 locations), 38%, and 40% (at 2 locations) at the southeast corner
- readings of 22%, 32%, and 40% (at 2 locations) adjacent to the laundry door
- readings of 22% and 24% at a north corner column
- a reading of 32% above the kitchen window
- readings of 22%, 32% and 40% at the junction of the cladding and an external masonry wall.

Moisture levels above 18% recorded after cladding is in place generally indicate that external moisture is entering the structure. The expert also noted that the soft brown drill bit shavings obtained adjacent to the laundry door suggested that the framing is decaying at this location.

5.3 The expert made the following specific comments on the cladding.

- Apart from one added horizontal control joint, there are no vertical or horizontal control joints installed in the cladding
- There is no foam tape installed to the base of the cladding
- the base of the cladding is buried in the ground or in the paving or in the balcony tiles, or is too close to the ground level, at some locations
- the flanges of some windows are buried in the cladding and the sealant between the window flanges and the cladding is not in accord with the manufacturers recommendations and is ineffective
- the wooden fascia is fitted hard against the roof membrane at some locations and the nails fixing the fascias penetrate the membrane
- at some locations where there are no eaves projections, the metal cap flashing over the roofing membrane has no upturn where it meets the wall cladding
- the junction of the roofing membrane with the adjoining pergola beam is not effectively sealed

- the roof membrane has burst apart at one formed gutter corner
- the balcony door thresholds are too close to the deck tiling
- some of the balcony balustrade fixing bolts are not sealed where they penetrate the deck tiles or the wall cladding
- the balcony deck membrane is buried under the deck tiling and this could allow moisture to enter the cladding
- a garden stone wall is in contact with the cladding.

5.4 The expert also noted that 2 internal columns at the southwest void of the house, shown on the consented plans, were not constructed.

5.5 Copies of the expert's report were provided to each of the parties.

## 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>, which in this case is 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; 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 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 antecedents, the Building Industry Authority, have also described weathertightness risk factors in previous determinations (refer to Determination 2004/1 *et al*) relating to cladding and these factors are also used in the evaluation process.

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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).

6.1.3 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 the quality of its installation to be carefully carried out.

## 6.2 Weathertightness risk

6.2.1 In relation to these characteristics I find that the house:

- is built in a medium wind zone
- is two storeys high plus an extensive basement
- has three balconies, one of which is partially constructed over a living space
- is complex in plan and form
- generally has 800mm wide eaves projections, which together with the balconies and the cantilevered building extensions and flat roof areas, provide good protection to the cladding below them. However, there is a lack of eaves projections at some locations
- has external wall framing that is not likely to be treated to a level of resistance that would delay the onset of decay if the framing absorbs and retains moisture.

6.2.2 An evaluation of these weathertightness risk features using the E2AS1 risk matrix suggest 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.

## 6.3 Weathertightness performance

6.3.1 It is clear from the expert's report that the cladding installed on this house is unsatisfactory in terms of its weathertightness risk and performance perspectives and considerable work is required to make the building code compliant. The high levels of moisture ingress at several locations and the evidence of decay found in some of the associated framing are major concerns. In addition, I note that the expert was requested by the owner not to complete a full invasive moisture check. Further investigation is urgently required to ensure that the structural integrity of the affected elements has not been compromised.

6.3.2 I note the expert's comments as described in paragraph 5.4, regarding two internal columns that have been omitted. While I also note the owner's assertion that these columns were only decorative, the columns are shown on the consent drawings and referenced in the structural drawings which I have not seen. I strongly advise the

territorial authority to investigate this matter in order to ensure that this omission does not affect the structural stability of the house.

## 7 Conclusion

- 7.1 I am satisfied that the current performance of the cladding is inadequate because it has not been installed according to good trade practice and is currently allowing water penetration into the wall framing through defects in the cladding and adjacent roofing. In particular, it demonstrates the key defects listed in paragraph 5.3. 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.
- 7.2 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 in this building are allowing the ingress of moisture at present, the house does not comply with the durability requirements of clause B2.
- 7.3 I find that, because of the extent and apparent complexity of the faults that have been identified with this cladding, I am unable to conclude, with the information available to me, that remediation of the identified faults, as opposed to partial or full re-cladding, could result in compliance with clause E2. I consider that final decisions on whether code compliance can be achieved by either remediation or re-cladding, or a combination of both, can only be made after a more thorough investigation of the cladding. This will require a careful analysis by an appropriately qualified expert. Once that decision is made, the chosen remedial option should be submitted to the territorial authority for its comment and approval. If the territorial authority chooses to reject the proposal, then the owner is entitled to seek a further Determination on whether the proposed remedial work will lead to compliance with the requirements of clauses E2 and B2.
- 7.4 I note that, once the building has been made compliant with the Building Code, effective maintenance of monolithic claddings is important to ensure ongoing compliance with clause B2 of the Building Code. That maintenance is the responsibility of the building owner. The code assumes that the normal maintenance necessary to ensure the durability of the cladding is carried out. For that reason clause B2.3.1 of the Building Code requires that the cladding be subject to “normal maintenance”. That term is not defined, and I take the view that it must be given its ordinary and natural meaning in context. In other words, normal maintenance of the cladding means inspections and activities such as regular cleaning, repainting, replacing sealants, and so on. As the external wall framing is treated to a level that

will not delay the onset of decay if it becomes wet, I would recommend that periodic moisture content be carried out to all areas of the external cladding

- 7.5 In the circumstances, I decline to incorporate any waiver or modification of the Building Code in this Determination.

## **8 The decision**

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

- 8.1 In accordance with section 20 of the Building Act 1991, I hereby determine that the monolithic cladding system as installed 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 owner 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 owner 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 clause 8.2. Initially, the territorial authority should issue the notice to fix, listing all the items that the territorial authority considers to be non-compliant. The owner 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.

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

- 8.4 I note that the relevant provision of clause B2 of the building code is that building elements must, with only normal maintenance, continue to satisfy the performance requirements of the code for certain periods "from the time of issue of the applicable code compliance certificate".
- 8.5 As set out in paragraph 4.1, the territorial authority has concerns about the durability, and hence the compliance with the building code, of all the elements of the house, other than the cladding, taking into consideration the completion date of the building in 1999. I am of the opinion that the territorial authority should amend the original building consent by making it subject to a waiver of the building code in accordance with section 34(4) of the Act to the effect that the durability of the elements about which they have concerns is to be measured from the date of the substantial completion of the building instead of from the time of the issue of the code compliance certificate. The land information memorandum relating to this house should also be amended in line with the above. For the purposes of this determination I am of the opinion that "substantial completion" of the building is achieved when the building is ready for occupation.

- 8.6 I therefore determine that the territorial authority is to amend the original consent to incorporate a waiver of clause B2 of the building code to the effect that the required durability periods for the elements of concern to the territorial authority are to be measured from the date of the substantial completion of the building and not from the date of the issue of a code compliance certificate. If the durability period relating to any element would have expired under the above criteria, consideration should be given to waiving in full the B2 requirement for these items.
- 8.7 Following this amendment, any code compliance certificate subsequently issued by the territorial authority should be issued in line with the amended building consent.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 02 May 2006.

John Gardiner  
**Determinations Manager**