

## ***Determination 2005/112***

# ***Refusal of a code compliance certificate for a building with a “monolithic” cladding system at 18 Centennial Place, Campbells Bay, North Shore City – House 97***

## **1 THE DISPUTE TO BE DETERMINED**

- 1.1 This is a determination of a dispute referred to the Chief Executive of the Department of Building and Housing (“the Chief Executive”) under section 17 of the Building Act 1991 (“the Act”), as amended by section 424 of the Building Act 2004. The applicants are the joint owners Mr and Mrs Watson (referred to throughout this determination as the “owner”), and the other party is the North Shore City Council (referred to throughout this determination as “the territorial authority”). The application arises from the refusal by the territorial authority to issue a code compliance certificate for a 4-year-old house unless changes are made to its monolithic cladding system.
- 1.2 My task in this determination is to consider whether I am satisfied on reasonable grounds that the external cladding as installed (“the cladding”), which is applied to the external walls and balustrade columns of this house complies with the building code (see sections 18 and 20 of the Act). By “external 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.
- 1.3 This determination is made under the Building Act 1991 subject to section 424 of the Building Act 2004. That section came into force (“commenced”) on 30 November 2004, and its relevant provisions are:
- “ . . . on and after the commencement of this section,—
- “(a) a reference to the Authority in the Building Act 1991 must be read as a reference to the chief executive; and

- “(b) the Building Act 1991 must be read with all necessary modifications to enable the chief executive to perform the functions and duties, and exercise the powers, of the Authority . . . ”

It should be noted that the new legislation does not amend the determination process set out under the 1991 Act, other than to transfer the power to make a determination from the Building Industry Authority (“the Authority”) to the Chief Executive.

- 1.4 This determination refers to the former Authority:
- (a) When quoting from documents received in the course of the determination, and
  - (b) When referring to determinations made by the Authority before section 424 came into force.
- 1.5 In making my decision, I have not considered any other aspects of the Act or the building code.

## **2 PROCEDURE**

### **The building**

- 2.1 The building work is a two-storey detached house, with a large developed garage and basement area, situated on an excavated sloping site, which is in an undetermined wind zone. The external walls are of conventional light timber frame construction built on concrete block foundation and retaining walls, or on timber-framed floors, and are sheathed with monolithic cladding. The house is of a fairly complex shape, and the pitched roofs are at varying levels with numerous wall to roof junctions. Generally, the eaves have 535mm wide projections, and the verges have 170mm projections. The eaves are supported on rafter extensions that penetrate the cladding. The windows and hinged external doors have an overlap formed in the cladding over them finished with a plastic turndown bead.
- 2.2 A balcony is constructed at the first floor level over a habitable space. A large timber-framed deck, which also forms the roof over the garage, and has a flight of access steps attached, is constructed at the ground floor level. Both the balcony and the deck have metal balustrades with intermediate monolithic-clad timber-framed columns. A smaller low-level timber-framed deck with attached steps is built at the ground floor level outside bedrooms 2 and 3. A small pergola is constructed over the porch. A full height monolithic clad timber-framed chimney is built against an external wall, and is set through an upper roof.
- 2.3 I have not received any written evidence of the treatment, if any, applied to the external wall framing.
- 2.4 The cladding system is what is described as monolithic cladding, and is a 50mm thick “Amocladd” system finished with a multi-coat mesh reinforced modified cement plaster. The faces of the balustrade columns are clad with polystyrene backing sheets, and the ends are clad with fibre-cement backing sheets. I note that

the plans describe the external cladding as being a 14mm fibre cement solid plaster system on 4.5 Hardibacker. The territorial authority does not appear to have referred to the cladding change in its correspondence to the owner.

### **Sequence of events**

- 2.5 The territorial authority issued a building consent on 26 October 2000. There were conditions attached to the consent that required notification for certain inspections, some of which pertained to the cladding.
- 2.6 The territorial authority carried out inspections during the course of construction. As regards the cladding, the territorial authority approved the pre-line building inspection on 27 March 2001, the post-line/bracing inspection on 26 April 2001, and the final building inspection, with the exception of ground clearances and the issuing of cladding producer statement, on 17 August 2001.
- 2.7 In a letter to the owner dated 11 March 2004, the territorial authority stated that, as the cladding was monolithic and faced fixed, it could no longer verify that it fully complied with the building code. Accordingly, it was unable to issue a code compliance certificate.
- 2.8 The territorial authority did not issue a Notice to Rectify as required under section 43(6) of the Act.
- 2.9 The owner applied for a determination on 2 February 2005.

### **3 THE SUBMISSIONS**

- 3.1 The owner forwarded to the Department an extensive covering submission prepared by a consultant. The submission set out the background to the dispute and expounded on the principles of the issue of a code compliance certificate. The consultant described the exterior envelope of the building and explained the requirements for compliance with clauses B2 and E2 and Approved Document E2/AS1, in the context of the house construction. The report noted that normal maintenance would also be undertaken and described how this would be implemented. The consultant concluded that the building will continue to comply with B2 and E2, and that there is no evidence of water ingress, decay or degradation of materials or elements that would lead to a failure of B2. The report also raised certain points of law, which are outside the ambit of this determination
- 3.2 The owner supplied copies of the plans.
- 3.3 The territorial authority made a submission in the form of a letter to the Authority dated 4 April 2005, which summarised the consent and inspection processes relating to the house. The territorial authority also noted that no specific cladding inspections had been undertaken for the external cladding system. The owner had been informed that, due to the type of monolithic cladding applied to the house, together with its attendant risk factors, the territorial authority was unable on reasonable grounds to

accept the compliance of the cladding. The territorial authority noted that the matter of doubt was:

- Whether the installed cladding system complies with clauses B2.3.1 and E2.3.2 of the Building Code.

3.4 The territorial authority supplied copies of:

- The specifications;
- The consent and inspection documentation;
- The producer statements; and
- The correspondence with the owner.

3.5 The copies of the submissions and other evidence were provided to each of the parties. Neither the owner nor the territorial authority made any further submissions in response to the submissions of the other party.

#### **4 THE RELEVANT PROVISIONS OF THE BUILDING CODE**

4.1 The dispute for determination is whether the territorial authority's decision to refuse to issue a code compliance certificate because it was not satisfied that the cladding complied with clauses B2 and E2 of the building code (First Schedule, Building Regulations 1992) is correct.

4.2 There are no Acceptable Solutions that have been approved under section 49 of the Act that cover this cladding. The cladding is not accredited under section 59 of the Act. I am therefore of the opinion that the cladding system as installed must now be considered to be an alternative solution.

4.3 In several previous determinations, the Department has made the following general observations, which in my view remain valid in this case, about acceptable solutions and alternative solutions.

- Some acceptable solutions cover the worst case, so that in less extreme cases they may be modified 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 will be necessary to add some other provision to compensate for that in order to comply with the building code.

## **5 THE EXPERT'S REPORT**

5.1 The Department commissioned an independent expert ("the expert") to inspect and report on the cladding. The expert inspected the building on 26 May 2005, and furnished a report that was completed on 30 May 2005. It noted that the quality of finish was generally good, the plaster finish was smooth, and the coating was uniform and well adhered. The expert did not observe any significant level of discolouration. No control joints are evident in the cladding, and the expert did not observe any evidence of cracks or stress in the cladding that could arise from the lack of such joints. The expert noted that similar cladding products would not require control joints for buildings of the dimensions applying to this house. The expert removed the plaster coating to reveal the window perimeter details at one location, and noted that the windows were adequately flashed and sealed. Removal of the plaster at the junction of the cladding base and the plastered foundation wall revealed an effective detail, despite the lack of a flashing. The expert also made the following comments regarding the cladding:

- The ground clearances at the base of the cladding are insufficient at some locations. However, the expert was of the opinion that where there were drainage or closure grilles below the cladding, these were effective in preventing water reaching the framing;
- There is an unsealed vertical junction between the concrete block wall and the cladding at the southeast corner of the building;
- There is no coating behind the barge board above the entrance steps;
- The clearance between the base of the cladding and the roof apron flashings is inadequate at some locations, and the cladding base angle is loose outside the ensuite bathroom;
- The ends of the apron flashings lack kickouts;
- The eaves rafter extensions were fixed prior to the completion of the coating;
- The plumbing and meter box penetrations through the cladding are inadequately sealed;
- Ponding of water is evident on the floor of the first floor balcony, and the tops of the balustrade columns are flat;
- In relation to the large ground floor deck:
  - Ponding of water is evident on the floor of the deck,
  - No flashing is installed between the floor membrane and the cladding over it,
  - The metal flashing to the perimeter edge lacks end upturns, and the joints are not lapped,

- The base of the fibre-cement column cladding lacks a lap and clearance where it adjoins the floor membrane,
  - The tops of the balustrade columns are flat,
  - The balustrade frames fixed through the columns are inadequately sealed,
  - The balustrade post and stair plate fixings are inadequately sealed where they penetrate the floor membrane, and
  - A penetration through the floor is inadequately sealed.
- 5.2 The expert also noted that there were cracks in the garden wall cladding at the junctions between the flat panels and integral columns.
- 5.3 The expert took non-invasive readings at the interior linings of the exterior walls and no readings were obtained in the “damp” range of the meter. A further 10 invasive readings were then taken and the following higher readings were obtained:
- 18.5% and 20.8% at boundary joists over the basement floor space;
  - 19.7% and 29% at the plywood of the first floor deck; and
  - 42.5% at the balustrade stud of the large ground floor deck.

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

- 5.4 Copies of the expert’s report were provided to each of the parties. The territorial authority did not respond. The consultant employed by the owner submitted a report to the Department that was dated 30 June 2005. The report noted that the BRANZ appraisals were a higher test than that set out in the building code. The report also commented on certain issues that the expert had raised. These included the deck details, the roof-to-wall junctions, the ground clearances, the penetrations, and the continuation of the cladding at the entrance steps, which in all instances the consultant considered to be code compliant. The report noted that while the continuity of the cladding behind obstructions was not best practice, an increased level of maintenance would ensure continuing compliance. With regard to the balcony balustrade, the report noted that it was not an element of the structural framing and the moisture ingress associated with this element is isolated from the dwelling and not associated with undue dampness and decay. The failure was localised and would have been identified during the maintenance process. In addition, the top of the balustrade had positive falls and there is no evidence of ponding.
- 5.5 The consultant did not accept that the garden walls should be included in the determination. The report reiterated that the building envelope was only subject to localised failure that could be addressed by the maintenance programme and there was no evidence of a current clause B2 failure. The report concluded that the building was shown to be code compliant and would continue to meet the requirement of clauses E2 and B2 with normal maintenance.

## 6 DISCUSSION

### General

6.1 I have considered the submissions of the parties, the expert's report, the reports submitted by the consultant employed by the owner, and the other evidence in this matter. The approach in determining whether building work complies with clauses B2 and E2, is to examine 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 Authority and the Department have described the weathertightness risk factors in previous determinations (Refer to Determination 2004/01 *et al*) relating to monolithic cladding and I have taken these comments into account in this determination.

### Weathertightness risk

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

- Has 535mm wide eaves projections that would provide good protection to the cladding areas below them, and 170mm verge projections that only provide minimal protection;
- Is two storeys high, with a developed basement;
- Is of a fairly complex shape on plan, with roofs that have numerous roof to wall junctions;
- Has one balcony and one deck that are both constructed over habitable or garage spaces;
- Has windows and doors that are adequately flashed or sealed;
- Has lower level roof spaces to restricted locations that assist in the ventilation of the external wall cavities above them; and
- Has external wall framing that is unlikely to be treated to a level that would help prevent decay if it absorbs and retains moisture.

### Weathertightness performance

6.3 Generally, the cladding appears to have been installed according to good trade practice and to the manufacturer's instructions, but some junctions, edges, and penetrations are not well constructed. These areas are described in paragraph 5.1, and in the expert's report, as being:

- The insufficient ground clearances at the base of the cladding at some locations;
- The unsealed vertical junction between the concrete block wall and the cladding at the southeast corner of the building;

- The lack of a coating behind the barge board above the entrance steps;
- The inadequate clearance between the base of the cladding and the roof apron flashings at some locations, and the loose cladding base angle outside the ensuite bathroom;
- The lack of kickouts to the ends of the apron flashings;
- The eaves rafter extensions being fixed prior to the completion of the coating;
- The inadequately sealed plumbing and meter box penetrations through the cladding;
- The ponding of water on the floor of the first floor balcony, and the flat tops of the balustrade columns; and
- The deficiencies apparent in the large ground floor deck.

6.4 Notwithstanding the fact that the backing sheets are fixed directly to the timber framing, thus inhibiting drainage and ventilation behind the cladding sheets, I find that there are compensating factors that assist the performance of the cladding in this particular case:

- The cladding generally appears to have been installed according to good trade practice;
- The house has eaves projections that provide some protection to the cladding below them;
- The external doors and windows are adequately flashed or sealed; and
- The house has lower level roof spaces to restricted areas that assist in the ventilation of the external wall cavities above them.

6.5 I consider that these factors help compensate for the lack of a drainage and ventilation cavity, and can allow the house to comply with the weathertightness and durability provisions of the building code.

6.6 I note that the expert has commented on the requirements regarding control joints in the cladding. I accept in this instance, that as comparable polystyrene cladding systems would not require control joints for a house of these dimensions, control joints are not required in the cladding applied to this house. This opinion is reinforced by lack of movement demonstrated by the cladding, and its age.

6.7 I also draw the parties' attention to the expert's comments regarding the garden wall cladding, and recommend that suitable remedial work be undertaken if, on further examination, this is perceived to be a problem.

6.8 I note that two elevations of the house demonstrate a moderate weathertightness risk rating and the remaining two elevations demonstrate a high risk rating as calculated

using the E2/AS1 risk matrix. 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.

## **7 CONCLUSION**

- 7.1 I am satisfied that the current performance of the cladding is not adequate because it is allowing water penetration into the house in at several locations, which could affect the cladding of the house. Consequently, I am not satisfied that the cladding system as installed on the house 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 house will allow the ingress of moisture in the future, the house does not comply with the durability requirements of clause B2 of the building code.
- 7.3 I consider that, because the faults that have been identified with this cladding occur in discrete areas, I am able to conclude that satisfactory rectification of the items outlined in paragraph 6.3 is likely to result in the house being weathertight and in compliance with clauses B2 and E2, notwithstanding the lack of a ventilated cavity.
- 7.4 I note that 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, re-painting, replacing sealants, and so on.
- 7.5 It is emphasised 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 THE DECISION**

- 8.1 In accordance with section 20 of the Building Act 1991, I hereby determine that the cladding system as installed on the house does not comply with clause E2 of the building code. There are also a number of items to be remedied to ensure that the house remains weathertight and thus meet the durability requirement of the code. Consequently, I find that house does 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 paragraph 6.3 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 being weathertight and in compliance with clauses B2 and E2, notwithstanding the lack of a ventilated cavity.
- 8.3 I note that the territorial authority has not issued a Notice to Rectify. The territorial authority should now issue a notice to fix, and the owner is then obliged to bring the house 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, with either of the parties entitled to submit doubts or disputes to the Chief Executive for another determination.
- 8.4 Finally, I consider that the cladding will require on-going maintenance to ensure its continuing code compliance.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 27 July 2005.

John Gardiner  
**Determinations Manager**