

## **Determination 2005/159**

### **Refusal of a code compliance certificate for a house with a “monolithic” cladding system at 35A Bracken Avenue, Takapuna, North Shore City – House 130**

#### **1. The dispute to be determined**

- 1.1 This is a determination of a dispute under Part 3 Subpart 1 of the Building Act 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 owner, Mr Owens (“the owner”), and the other party is the North Shore City Council (“the territorial authority”). The application arises because no code compliance certificate was issued by the territorial authority for this 5-year-old house.
- 1.2 The question to be determined is whether I am satisfied on reasonable grounds that the monolithic wall cladding as installed to the external walls of the building (“the cladding”), complies with the Building Code (see sections 177 and 188 of the Act). By “the monolithic wall 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 In making my decision, 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 a detached house situated on a level site, which is in a high wind zone for the purposes of NZS 3604. The house is two storeys high, except for a number of single-storey ground floor projections. Construction is conventional light timber frame, with concrete slab, concrete block foundations, monolithic wall cladding and aluminium windows. The house shape is fairly simple in plan, with 25° concrete tile roofs over upper and lower roofs. The upper roof is a hip roof with one

gable, while lower roofs form lean-tos against the upper walls, with a mono-pitched roof extending to form an entrance canopy. Eaves projections are generally 425 mm wide, and there are no verge projections above the ends of the gable and lean-tos. There is a timber pergola to one end of the northeast elevation, which is fixed through the cladding into the exterior walls.

- 2.1.2 The specification calls for wall framing to comply with NZS 3602, which at the time of construction would permit untreated timber. I have received no other written evidence as to the treatment, if any, of the external wall framing timber. Based on this evidence, I consider that the external wall framing is unlikely to be treated.
- 2.1.3 The cladding is a monolithic cladding system described as stucco over a solid backing. In this instance it consists of 4.5 mm “Hardibacker” sheets fixed through the building wrap directly to the framing timbers, and covered by a slip layer of building wrap, metal-reinforced 22 mm thick 3-coat plaster system and a flexible paint coating.
- 2.1.4 I have seen no evidence of producer statements or warranties for the cladding.
- 2.1.5 I note that all elevations of the building demonstrate a high weathertightness 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.
- 2.1.6 Accordingly I consider this stucco cladding to be an alternative solution (refer to paragraph 4.2).

## **2.2 Sequence of events**

- 2.2.1 The territorial authority issued a building consent on 15 February 2000.
- 2.2.2 The territorial authority carried out various inspections during construction, including pre-plastering, pre-line and post-line. A final building inspection was carried out on 5 December 2003, and the territorial authority’s inspection summary notes “recheck required”.
- 2.2.3 On 4 February 2004, a consultant engaged by the owner (the owner’s consultant) wrote to the territorial authority in regard to the pergola fixings. The territorial authority carried out a further inspection on 1 June 2004, and the inspection summary notes “is now resolved”, with a further comment, dated 2 June 2004, noting “Weathertightness inspector to inspect”.
- 2.2.4 The territorial authority carried out a visual inspection on 14 June 2004. In a letter to the owner dated 23 June 2004, the territorial authority stated that the Building Code required the building work to remain durable for specific periods. The territorial authority also noted that:

As your building is face fixed (monolithic) construction with no cavities we are unable to verify that it fully complies with the Building Code requirements, manufacturer's details applicable at the time and that it will remain durable for the required period.

- 2.2.5 The territorial authority listed certain weathertightness risk factors identified with the building, together with a list of defects and stated that, due to the 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.
- 2.2.6 Following discussions with the territorial authority, the owner carried out work to remedy the identified defects, but there appears to have been no further inspections.
- 2.2.7 The territorial authority did not issue a Notice to Rectify as required under section 43(6) of the Building Act 1991.
- 2.2.8 The Department received the owner's application for a determination on 12 August 2005.

### **3. The submissions**

- 3.1 In a letter accompanying the application, the owner described the construction and history of the project and noted that all phases of construction had been inspected for compliance with the Building Code that prevailed at the time of construction. The owner concluded by noting:

I have to the best of my knowledge experienced no problems with the cladding or the house in any way having resided in it since it was built and will continue to do so.

- 3.2 The owner forwarded copies of:

- the drawings and specifications
- some of the consent documentation
- some of the inspection records
- the letter from the owner's consultant to the territorial authority
- some of the correspondence with the territorial authority
- various other statements.

- 3.3 The territorial authority forwarded copies of:

- some of the consent documentation
- some of the inspection records
- some of the correspondence with the owner.

- 3.4 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. 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 B2.3.1 and E2.3.2 of the Building Code (First Schedule, Building Regulations 1992) is correct.
- 4.2 No Acceptable Solutions have been approved under section 22 of the Act that cover the monolithic cladding as installed on this house. The cladding is not currently certified under section 269 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 they may be modified in less extreme cases and the resulting alternative solution will still comply with the Building Code.
  - Usually, when there is non-compliance with one provision of an Acceptable Solution, it will be necessary to add some other provision to compensate for that in order to comply with the Building Code.

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

- 5.1 The Department commissioned an expert who inspected the cladding on 15 September 2005, and furnished a report that was completed on 30 September 2005. The expert noted that the surface finish to the plaster coating generally appeared good, but that many cracks were evident. The expert noted that penetrations through the cladding generally appeared to be sealed, clearance from cladding to ground and roof generally appeared adequate, and adequate vertical and horizontal control joints appeared to be provided. The expert cut away a small section of plaster over a control joint to examine the joint. The expert also cut away a small section of plaster at the head to jamb and sill to jamb junctions of a window to inspect the flashings, and noted the uPVC jamb flashings, and aluminium head and sill flashings. I accept that the locations opened are typical of similar locations around the building.
- 5.2 The expert took non-invasive moisture readings at skirting level through interior linings, and recorded no elevated readings. Approximately 50 further invasive moisture readings were taken through the cladding under windows and other risky areas, and the following elevated readings were noted:

- 21% and 22% under the northwest window of the master bedroom
- 24% at the north corner near the kitchen doors
- 32% under a jamb of the northeast window of the bedroom above the pergola
- 21% under a jamb of the ground floor bedroom
- 24% at the wall end of the lean-to canopy above the kitchen doors
- 26% at the middle of the lean-to wall to the canopy above the kitchen doors
- 19% at the post end of the lean-to canopy above the kitchen doors
- 28% under a jamb of the southwest window of a bedroom above the living room
- 23% under a jamb of the southwest window of the living room
- 20% and 22% beside the bottom of jambs to the garage door.

5.3 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 specific comments on the cladding.

- While cladding clearances and base overlaps were not in accordance with the requirements of E2/AS1 at several locations, the addition of drainage channels together with the shelter provided by canopies to paving at the main entry and kitchen door protect these locations.
- Although remedial work has been carried out to improve cladding clearances to paving beside the garage doors, and the area now appears adequately drained, moisture levels beside the door jambs are still elevated at 20% and 22%.
- Windowsill and head flashings lacked stop-ends, and many were recessed within the outer line of the plaster face rather than extending beyond the face.
- The vertical control joints and the sealant positions do not appear to be fully in accordance with the standard for solid plastering.
- Despite the adequate provision of control joints, there are many cracks in the plaster. Many of these are randomly located on the northeast and northwest elevations, where upper walls are offset and not directly supported by lower walls and foundations, which may be causing undue movement in the walls.
- The gas meter box is flashed, but is poorly sealed with gaps showing.
- The electricity meter box has no top flashing, but appears well sealed.

- 5.5 Copies of the expert's report were provided to each of the parties.
- 5.6 In a letter dated 2 November 2005, to the Department and the territorial authority, the owner commented on several items in the expert's report, noting the shelter and drainage provided at the entry area and the rear kitchen door, and also noting that the issue of stop ends to window flashing was never raised during inspections by the territorial authority.

## **6. Discussion**

### **6.1 General**

- 6.1.1 I have considered the submissions of the parties, the expert's report 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 Building Industry 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 considered these comments in this determination.

### **6.2 Weathertightness risk**

- 6.2.1 In relation to these characteristics I find that the house:
- is built in a high wind zone
  - is a maximum of two storeys high
  - has an attached pergola
  - is fairly simple in plan, but with a number of complex roof to wall junctions
  - has eaves projections of 425 mm overall, and no verge projections
  - has monolithic cladding which is fixed directly to the framing
  - has external wall framing that is not treated, so providing no resistance to the onset of decay if the framing absorbs and retains moisture.

### **6.3 Weathertightness performance**

- 6.3.1 Generally the cladding appears to have been installed satisfactorily, but some junctions, edges and penetrations are not well constructed. These areas are all as described in paragraph 5.4 and in the expert's report as being the:
- lack of clearance to the stucco at the sides of the garage door

- inadequate projections of sill and head flashings beyond the cladding face
- lack of stop ends to sill and head flashings
- cracking of the stucco at many locations, in particular to the northeast and northwest elevations, despite the provision of control joints
- poor sealing of the gas meter box
- lack of flashing to the top of the electricity meter box

6.3.2 I note the expert's comment regarding the provision for drainage and shelter over the main entry and kitchen doors, and accept that the cladding clearances and overlaps are adequate in these circumstances.

6.3.3 I note the expert's comment regarding movement being the possible reason for the amount of cracking to the cladding, and consider that possible causes require further investigation followed by appropriate remediation, in order to prevent cracking from recurring following repairs.

## **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 a number of 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 are likely to allow the ingress of moisture in the future, the house does not comply with the durability requirements of clause B2.

7.3 I consider that further investigations are required to establish the reasons for the significant amount of cracking to the cladding on the upper walls of the house, which appears to be due to undue flexibility created by the heavy roof loading without walls that can directly transfer these loads to the foundations. I consider that appropriate remediation will be required to prevent cracks recurring following repairs.

7.4 Subject to further investigations that may identify other faults, I consider that, because the faults that have been identified with the cladding system occur in discrete areas, I am able to conclude that satisfactory rectification of the items outlined in paragraph 6.3.1 is likely to result in the building remaining weathertight and in compliance with clauses B2 and E2.

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

## **8. The decision**

- 8.1 In accordance with section 188 of the Act, I hereby determine that the monolithic cladding system as installed does not comply with clause E2 of the Building Code. There are a number of items to be remedied to ensure that the house becomes and remains weathertight and thus meets the durability requirements of the Building Code. Consequently, I find that the 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 6.3.1, to the approval of the territorial authority, along with any other faults that may become apparent in the course of that work, is likely to result in the house remaining weathertight and in compliance with clauses B2 and E2.
- 8.3 I note that the territorial authority has not issued a Notice to Rectify. A notice to fix should be issued that requires the owners to bring the cladding into compliance with the Building Code, without specifying the features that are required to be incorporated. 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.
- 8.4 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.



8.5 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 5 December 2005.

John Gardiner  
**Determinations Manager**