

## **Determination 2005/136**

### **Refusal of a code compliance certificate for a house with a monolithic cladding system at 43 Bayliss Road, RD3, Te Puke – House 116**

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

- 1.1 This is a Determination under Part 3 Subpart 1 of the Building Act 2004 (“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 Scott Cameron (“the owner”), and the other party is the Western Bay of Plenty District Council (“the territorial authority”). The application arises because the territorial authority declines to issue a code compliance certificate for a 7-year-old house, unless changes are made to its monolithic cladding system.
- 1.2 The question to be determined is whether I am satisfied on reasonable grounds that the monolithic wall cladding as installed to the timber-framed external walls of the house (“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. The territorial authority has not raised any issues regarding the timber weatherboards that make up the balance of the external cladding. However, I have commented on these in this Determination.
- 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 two-storey house, with single-storey extensions, situated on a level site that is in a high wind zone in terms of NZS 3604: 1999 “Timber framed buildings”. The building is of a relatively complex shape on

plan and the varying-level low pitched roofs have parapet walls to their perimeters and wall to roof junctions. There is a 700mm wide eaves projection adjacent to bedroom 2 and a roof extension over the porch area, which is supported on monolithic-clad timber-framed columns. The exterior walls are of conventional light-timber frame construction built on concrete blockwork foundation walls or intermediate timber-framed floors and are sheathed with monolithic cladding. Narrow plinths project from the walls at the first floor and roof levels at two elevations.

- 2.1.2 A timber-framed balcony is constructed at the first floor level adjacent to bedroom 1 and this is supported on monolithic-clad timber-framed columns. The balcony has a combination of metal and monolithic-clad timber-framed balustrades. A monolithic-clad timber-framed chimney is built against one wall and this is set into the roofline. A freestanding timber pergola adjoins the west elevation of the house.
- 2.1.3 The specification describes the wall framing as “Laserframe” without any mention of treatment and the owner claims that H1 boric treated timber was used for the external wall framing. However, I have not received any written evidence as to the treatment, if any, of this framing.
- 2.1.4 The timber-framed external walls and columns of the house that are the subject of this Determination are clad with a system that is described as monolithic cladding. In this instance it incorporates fibre-cement backing sheets fixed through the building wrap directly to the framing timbers. The sheets are finished with a two-coat 20 to 22mm thick wire mesh reinforced solid plaster, followed by a final flexible paint system. I note that the plans call for three-coat plaster but the expert commissioned by the Department to inspect the cladding (“the expert”) has confirmed that two-coat plaster is applied to the house. I also note that a two-coat plaster application does not conform to the requirements of NZS 4251. Plastered polystyrene bands are applied over the cladding at the high-level parapet lines.

## **2.2 Sequence of events**

- 2.2.1 The territorial authority issued a building consent for the project on 13 October 1997. The conditions attached to the consents noted that the consent was approved subject to certain inspections being requested and these included references to the cladding. The exterior windows and doors were to be correctly flashed. The owner applied for an amendment to the building consent in relation to a concrete garage slab on 5 November 1997.
- 2.2.2 The territorial authority carried out various inspections throughout the construction of the property. In a letter to the owner dated 8 May 2003, the territorial authority stated that it intended to inspect the property to determine what progress had been made on the project. The territorial authority set out four alternatives that could result from the inspection. The territorial authority also attached a table of the inspections that it had already carried out.
- 2.2.3 A building certifier, Building Inspection and Advisory Service Ltd, issued a building certificate on 18 February 2004 for the closing in and venting of the fireplace.

2.2.4 Following an inspection on 18 February 2004, the territorial authority noted with regard to the cladding:

Urgent!! Cracks in plaster – plaster hard onto roof flashings – no gap. Some plaster bubbled. Exterior cladding not installed to manufacturer's specification.

2.2.5 The territorial authority wrote to the owner on 28 July 2004, advising that it declined to issue a code compliance certificate for the house. The territorial authority noted that the house had a monolithic cladding and the territorial authority was not satisfied on reasonable grounds that it complied with the requirements of clause E2. The territorial authority nominated three alternative procedures that could be followed to achieve code compliance.

- Remove the cladding to check the condition of the framing.
- Remove the cladding and replacing with either a non-monolithic cladding or a monolithic cladding with a suitable moisture management system such as a drained cavity.
- Apply to the Authority for a Determination.

2.2.6 The territorial authority has not issued a Notice to Rectify or a notice to fix.

2.2.7 The owner applied for a Determination on 22 June 2005.

### **3 The submissions**

3.1 The owner provided copies of the:

- building plans and specifications
- consent and inspection documentation
- correspondence from the territorial authority
- building certifier's certificate.

3.2 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 decline to issue a code compliance certificate because it was not satisfied that the monolithic cladding applied to the house 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 22 of the Act or section 49 of the Building Act 1991 that cover the cladding. The current Acceptable Solution, E2/AS1, allows for solid plaster systems with fibre cement backing sheets, but requires that they be fixed on battens to create a 20mm cavity between the sheet and the framing. The previous acceptable solution E2/AS1, which was in force when this consent was issued, allowed for mesh reinforced solid plaster to be applied to fibre cement backing sheets that were face fixed to the framing. 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 remain valid in this case in my view, 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 experts report**

- 5.1 The expert inspected the cladding of the building on 15 August 2005 and furnished a report that was completed on 24 August 2005. The expert noted that the exterior of the building generally lacks attention to detail and to the design and execution of the weathertight process. The expert removed areas of cladding adjacent to various external joinery units in order to reveal the flashing details. I am prepared to accept that these examples apply to similar details throughout the house. The expert made the following comments regarding the cladding:
- there is no evidence that the reinforcing mesh is spaced off the framing and the mesh is showing signs of rusting
  - the layers of plaster are delaminating
  - there are vertical and horizontal cracks in the plaster to the walls, the parapets, and the columns at numerous locations. The paint is also blistering at these locations
  - there is no evidence that vertical or horizontal control joints have been installed
  - the base of the cladding is carried down onto the paving and garden areas at most locations
  - the base of the cladding is hard onto the roof flashings, the deck surfaces of the balcony, and the plinths

- the roof flashings are poorly constructed
- the head flashings to the external joinery units are cut flush with the window jambs and holes are visible at these junctions
- the external joinery units lack jamb and sill flashings and the plaster has shrunk away from the frames
- there are no cross-falls or metal flashings installed to the tops of the roof parapets or to the balcony balustrade
- there are no flashings are installed at the junction of the balcony balustrades and the main wall cladding
- the metal balcony balustrades are surface fixed through the perimeter upstands
- the west elevation block garden wall is built against the plaster, and as the wall is not capped or filled, it will hold any water that enters the wall cladding
- the rainwater head cut into the polystyrene bands is not sealed
- the outlets from the gutters are not sealed or flashed where they enter the rainwater heads
- the plaster is not painted behind the rainwater heads and the downpipes
- there is no provision is made for ventilation or drainage in the parapets, and as a consequence, they are holding water
- there is no drip edge is formed at the chimney cap, water is blistering the paint, and the galvanized steel cap plate is corroding.

5.2 The expert took non-invasive readings through the interior linings of the exterior walls and following elevated readings were obtained:

- 20%, 42%, and 57% (at three locations) at the ground floor
- 30%, 50% (at two locations), and 57% (at two locations) at the first floor.

5.3 The expert also took invasive readings where the cladding had been removed. Elevated readings of 30% at the kitchen, laundry and a deck support column were obtained.

5.4 Moisture levels above 18% recorded after cladding is in place generally indicate that external moisture is entering the structure. The locations where the cladding was removed also showed evidence of water entry and some material damage.

5.5 The expert noted that the some of the roof fixings are loose and that some purlins have no fixings. The roof moves when walked over, so some damage has occurred due to foot traffic and the damaged sections are temporarily repaired with silicone.

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

## **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 taken these comments into account in this Determination.

### **6.2 Weathertightness risk**

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

- has no roof projections to provide some protection to the cladding areas below them, apart from the roof overhangs and wall plinths
- is in a high wind zone
- is a maximum of two storeys high
- is of a relatively complex shape on plan
- has a first floor balcony that is not constructed over a habitable space
- has external wall framing that is likely not to be treated, so is ineffective in helping prevent decay if it absorbs and retains moisture.

### **6.3 Weathertightness performance**

6.3.1 I find that the monolithic cladding in general does not appear to have been installed according to good trade practice. As a result, there are a number of identified defects, set out in paragraphs 5.1 and 5.5, and in the expert's report, which have contributed to the moisture penetration already evident in several locations in the external walls, parapets, and the columns of the house.

6.3.2 The expert has identified the cracking of the plaster and the ingress of moisture to at least one of the columns supporting the balcony. I suggest that the territorial authority urgently investigate all the support columns of the house and instigate any remedial work that might be required to ensure the continuing structural stability of these members.

- 6.3.3 I note that two elevations of the house demonstrate a high weathertightness risk rating and the remaining two elevations a very high risk 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 constructed 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 inadequate because it has not been installed according to good trade practice and is allowing water penetration into the wall, parapet and column framing through numerous defects in the cladding at present. In particular, it demonstrates the key defects listed in paragraph 5.1 and 5.5. 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.

- 7.5 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 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.
- 8.4 Finally, I consider that the cladding will require ongoing 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 October 2005.

John Gardiner  
**Determinations Manager**