

## **Determination 2005/142**

### **Refusal of a code compliance certificate for a house with a “monolithic” cladding system at 5 Crompton Road, Massey – House 120**

#### **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 applicants are the owners, Mr and Mrs Khan (“the owner”) and the other party is the Waitakere City Council (“the territorial authority”). The application arises because no code compliance certificate was issued by the territorial authority for this 3-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 large detached house situated on a gently sloping site, which is in a medium wind zone for the purposes of NZS3604. The house is two storeys high, except for several single-storey ground floor projections. Construction is conventional light timber frame, with concrete slab and foundations, aluminium windows and monolithic wall cladding, except for single-storey areas of brick veneer used on the front east elevation and part of the south elevation. The house shape is

moderately complex in plan, with 25° pressed metal tile hip roofs over upper and lower roofs and a gable forming an entrance canopy. Eave projections are 330 mm wide, except for the end of a lower level lean-to, which has no verge projection. A horizontal band of monolithic cladding is used between lower level roof projections at the inter-storey junction. An enclosed deck, with liquid-applied membrane floor and monolithic-clad balustrades, extends from an upper floor bedroom above the dining room below.

- 2.1.2 The expert commissioned by the Department to inspect the cladding (“the expert”) noted no evidence as to timber treatment. The specification calls for wall framing to be boron treated, but does not specify the level of treatment. I have received no other written evidence as to the treatment, if any, of the external wall framing timber.
- 2.1.3 The cladding system to the building is what is described as monolithic cladding, and is a “Harditex” system with 7.5 mm thick fibre cement sheets fixed through the building wrap to the framing, and finished with an applied textured coating system. The inter-storey bands are formed with polystyrene fixed over the unsealed fibre cement backing sheets, prior to the application of the coating system.
- 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 face-fixed fibre-cement sheet 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 12 October 2001, and carried out various inspections during the course of construction, including prior to lining installation and following lining installation. It appears that the house was completed in May 2002, although final inspections were not carried out until late 2004.
- 2.2.2 Following an inspection on 10 August 2004, the territorial authority issued a Notice to Rectify, with the attached “Particulars of Contravention” requiring the owner to:
- Remove the monolithic cladding and replace with an approved cladding system which has been subjected to the Council’s recently adopted inspection system.
- 2.2.3 Following the last inspection on 10 November 2004, the territorial authority issued a second Notice to Rectify, with the attached “Particulars of Contravention” providing a list of defects, and requiring the owner to:
- Provide adequate ventilation to the monolithic cladding and into the wall frame space by means of either a ventilated cavity or alternate approved system; or

Remove the monolithic cladding and replace with an approved cladding system...

- 2.2.4 The territorial authority advised the owner that a Determination could be sought on the refusal by the territorial authority to issue a code compliance certificate for the monolithic cladding.
- 2.2.5 The Department received the owner's application for Determination on 8 April 2005.

### **3. The submissions**

- 3.1 The owner stated that the matter of doubt:  
 ...concerns the WCC's refusal to approve the existing monolithic cladding system and issue a Code of Compliance Certificate.
- 3.2 The owner forwarded copies of:
- some of the building plans and specifications
  - some of the consent documentation
  - some inspection records
  - the two notices to rectify
  - various structural details, calculations and producer statements
  - Hardiflex technical information dated November 2004
  - a letter from the designer
- 3.3 The territorial authority made a submission in the form of a letter to the Department dated 21 April 2005, which summarised the consent and inspection processes relating to the building, explained the changed inspection procedures now implemented by the territorial authority, and noted that:
- In the absence of the additional inspections implemented as a consequence of those changed inspection procedures, and in the absence of a cavity as a first line of defence, the Council does not believe it is able to be satisfied, on reasonable grounds, that the cladding applied to this dwelling will achieve the functional requirements of Clause E2.2, or the performance requirements of Clause E2.3.2, of the Building Code.
- 3.4 The territorial authority forwarded copies of:
- some of the building plans
  - the territorial authority's inspection summary
- 3.5 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 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 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 ("the expert") to inspect the claddings. The expert inspected the claddings of the building on 15 September 2005 and furnished a report that was completed on 21 September 2005.
- 5.2 The expert noted that the cladding appeared uniform, flat and of a reasonable standard, with the textured coating smooth, well adhered and with no discolouration. Cladding clearances at the base of the walls were adequate, except for three areas. The expert noted that the windows had been face-fixed over sealant onto the cladding, with aluminium head flashings. The expert removed a small section of the jamb sealant, and noted that it was flexible, well adhered to the cladding and appeared to provide an adequate seal. The expert also cut away a section at the end of a horizontal band at the inter-storey junction to examine the underlying fibre cement horizontal joint. I accept that the locations opened up in this way are typical of similar locations around the house.
- 5.3 The expert took non-invasive moisture readings through interior linings below the corners of all windows and doors, and no elevated readings were noted. A further 6 invasive moisture readings were taken through the cladding at risky areas, and the following elevated readings were noted:
- 19.1% in the framing at the corner of the balustrade

- 20.6% in the boundary joist behind the horizontal band to fascia junction
- 19.3% in the bottom plate of the stairwell wall.

5.4 Moisture levels above 18% recorded after cladding is in place generally indicate that external moisture is entering the structure. The expert made the following specific comments on the cladding.

- There are no vertical control joints in the north wall of the garage, which exceeds the manufacturer's limit of 5400 mm for the length of a wall before such joints are recommended.
- There are a number of fine cracks in the cladding with bulging of joint fillers at some sheet joints, and evidence of recent repairs to one area.
- Clearances from the bottom of the cladding to adjacent ground levels are inadequate for the north and west walls of the garage, and for the stairwell wall on the east elevation.
- The cladding at the entrance butts against the paving, with no clearance. However, this area is well drained and sheltered by the entrance canopy.
- The textured coating does not cover the base of the cladding, leaving the bottom edges of fibre cement backing sheets exposed.
- The cut out of the west inter-storey band, where it butts against the garage gutter, revealed that the polystyrene had been fixed over unsealed fibre cement, with the coating applied after fixing. The gutter fascia was buried in the band, with the junction unsealed. The underlying joint had no movement gap and was not flashed. There was black mould on the building wrap behind, and the moisture content of the boundary joist was 20.6%.
- The ends of apron flashings at roof to wall junctions lack kick outs, and the ends of the gutters and fascias are buried in the coating. The canopy to garage wall junction has exposed building wrap and uncoated fibre cement. Attempts at repairs have been made for a similar junction above the kitchen, but these are heavily reliant on sealant for weatherproofing.
- There are unsealed gaps at the vertical junctions between the garage brick veneer and adjacent monolithic cladding.
- A number of penetrations through the cladding are unsealed.
- There are many fine cracks in the liquid-applied membrane deck floor, although no evidence of moisture penetration. The deck to inside floor vertical separation is only 45 mm with the cladding clearance about 20 mm, but the area appears weathertight with no evidence of moisture penetration.

- Handrail fixings penetrate the flat tops of the monolithic-clad balustrades, and there is a crack in the top cladding at the corner, with the moisture content of the framing below recorded at 19.1%.

5.5 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 these characteristics, I find that the house:

- is built in a medium wind zone
- is a maximum of two storeys high
- has an enclosed deck which is situated above living areas
- is moderately complex in plan and form, with two different cladding materials and some complex roof to wall junctions
- has eave projections of 330 mm, except for the north-west end of a lean-to which has no projection
- has monolithic cladding which is fixed directly to the framing
- has external wall framing that may not be 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 according to reasonable trade practice, but some junctions, edges, penetrations and decorative features 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 a vertical control joint in the north wall of the garage

- cracks and joint bulges in the monolithic cladding at a number of locations
- lack of clearance from the ground to the base of the cladding in some areas
- exposed unsealed bottom edges of the cladding
- lack of flashing and movement gap to the inter-storey junction, and unsealed cladding under the horizontal band
- lack of kick-outs, and inadequate weatherproofing to the ends of apron flashings at roof to wall junctions
- burying of gutters and fascias in the textured coating of the cladding
- inadequate weatherproofing of vertical junctions between the brick veneer and the monolithic cladding
- unsealed penetrations and fixings through the cladding
- cracks in the liquid-applied membrane of the deck floor
- flat monolithic-clad tops to the deck balustrades, top fixing of handrails and the crack in the balustrade cladding.

6.3.2 I note the expert's comments on the lack of clearance to the entry paving, and accept that the area is drained and well protected by the canopy above. I consider that the clearance is adequate in these circumstances.

6.3.3 I note the expert's comments on the cladding clearance and vertical floor separation of the deck, and the lack of evidence of moisture penetration. I consider that the clearances provided have provided adequate weathertightness over the past three years and, if well maintained, should continue to be adequate.

6.3.4 Notwithstanding the fact that the backing sheets are fixed directly to the timber framing, thus inhibiting drainage and ventilation behind the cladding sheets, I 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 reasonable trade practice
- the house has eave projections over most walls that provide some protection to the cladding areas below them.

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

## **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 have already allowed the ingress of moisture or are likely to allow it 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 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 being weathertight and in compliance with clauses B2 and E2.
- 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 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 cleaning, re-painting, replacing sealants, and so on. As the external wall framing is not treated, periodic checking of its moisture content should be carried out as part of normal maintenance.
- 7.5 I emphasise 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 these 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 being weathertight and in compliance with clauses B2 and E2.
- 8.3 I note that the territorial authority has issued two Notices to Rectify, which include a requirement to provide a ventilated cavity. The territorial authority should now withdraw the Notices to Rectify and issue a notice to fix requiring the owner to bring the cladding into compliance with the Building Code, without specifying the features that must 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 6.3.1. 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 21 October 2005.

John Gardiner  
**Determinations Manager**