

## **Determination 2005/173**

# **Refusal of a code compliance certificate for a house with a “monolithic” cladding system at 4 Killybegs Drive, Pinehill, North Shore City**

## **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 Kyuong Hee Hong (“the owner”). The other parties are the developer, Mr Thomas Wang (“the developer”) and the North Shore City Council (“the territorial authority”). The application arises because the territorial authority has not issued a code compliance certificate for this 4-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 new addition (“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 in terms of NZS 3604: 1999 “Timber framed buildings”. The house is two storeys high, except for two single-storey garage wings. Construction is conventional light timber frame, with concrete slab and foundations, aluminium windows and monolithic wall cladding, except for areas of brick veneer used on the front walls of the garage wings. The house shape is moderately complex

in plan, and has a 25° concrete tile hip roof over the upper level with a gable extending out from the upper roof to form an entrance canopy. One of the double garage wings has a hipped roof, while the other has a gable with the roof at the rear forming a lean-to. Eave projections are 480 mm wide, while verge projections are about 250 mm wide, except for the end of the garage lean-to, which has no projection. The entrance canopy is supported by timber piles, framed and clad in monolithic cladding to provide decorative circular columns that step out at the base to form fake plinths. A chimney, timber framed and clad in monolithic cladding, passes through the upper level eaves on the north elevation. Decorative bands of monolithic cladding are used around windows and horizontally at first floor level.

- 2.1.2 The expert commissioned by the Department to inspect the cladding (“the expert”) noted that the timber he was able to inspect did not appear to be treated. The specification calls for wall framing to comply with NZS 3602, which at the time of construction would permit untreated timber. Based on this evidence, I consider that the external wall framing is unlikely to be treated.
- 2.1.3 The cladding system to the addition 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. Decorative bands and other features 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.

## **2.2 Sequence of events**

- 2.2.1 The territorial authority issued a building consent on 8 February 2001 (Based on a building certificate issued by the building certifier on 19 January 2001). Approved Building Certifiers Ltd (“the building certifier”) undertook inspections during the construction.
- 2.2.2 The building certifier made various inspections during the course of construction, including prior to lining installation and following lining installation. The last inspection appears to have taken place on 6 July 2001, and the certifier’s inspection report notes final inspections as “pending”. The project was subsequently handed back to the territorial authority, and it appears that no further inspections were made until the owner applied for a code compliance certificate.
- 2.2.3 The territorial authority carried out a visual inspection on 14 March 2005. In a letter to the owner dated 23 March 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 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.
- 2.2.4 The territorial authority did not issue a Notice to Rectify as required under section 43(6) of the Building Act 1991.

2.2.5 The owner applied for a determination on 14 April 2005.

### **3. The submissions**

3.1 The owner stated that the matter of doubt was whether the wall cladding complies with the relevant clauses of the Building Code, and forwarded a copy of:

- the territorial authority's letter of 23 March 2005.

3.2 The territorial authority forwarded a copies of:

- the building plans and specification
- the consent documentation
- the building certifier's inspection summary
- the territorial authority's weathertightness inspection report

3.3 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 experts report

5.1 The expert inspected the claddings of the building on 13 September 2005 and furnished a report that was completed on 15 September 2005. The expert noted that the coating over the fibre cement appeared to be of a reasonable standard, with little visible cracking. However, the owner had advised the expert that this coating had been recently repaired. Cladding clearances at the base of walls appeared adequate in some areas but not in others. The expert noted that windows have aluminium head flashings. The expert cut away a small section of the polystyrene band at the sill to jamb junction and noted that the windows had been face-fixed onto sealant over unsealed fibre cement, with the polystyrene decorative bands fixed prior to the coating application. The expert also cut away a section of the horizontal band at the inter-storey junction. He noted that this band was also fixed over unsealed sheets, and that the underlying fibre cement horizontal joint had been flashed. I accept that the locations opened up in this way are typical of similar locations around the building.

5.2 The expert took non-invasive moisture readings through interior linings below the corners of all windows and doors, and noted elevated readings under the dining room window. Further invasive moisture readings were taken through the cladding and the following elevated readings were noted:

- 20% and 22% at either side of the gable-roofed garage door
- 22% at one side of the hip-roofed garage door
- more than 40% in the framing of the decorative plinths to the entry columns
- 21% under the lounge window near the dining room and 20% in the corner of the lounge adjacent to the entrance
- 22% at the jamb to sill junction, and 22% to 33% at the bottom plate below the dining room window
- 20% at the bottom of the corner and 23% under the west window of the kitchen
- 32% at the bottom of the jamb to the sliding doors in the family room

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

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

- there are no vertical control joints in three walls that are over the length above which the manufacturer recommends control joints, particularly the north and west walls
- the cladding at the entrance butts against the paving, with no clearance
- the textured coating over the decorative polystyrene features is falling off in many places, allowing water to penetrate into unsealed fibre cement behind

- the cut out of the band at a jamb to sill junction of the dining room window revealed visible mould on the unsealed fibre cement sheet behind
- the polystyrene decorative sill trim projects out about 100 mm, with limited fall to the top and the coating has been lapped up over the window sill flange, trapping moisture behind the coating
- there are no flashings at the horizontal junctions between brick veneer and the monolithic cladding above, and there are unsealed gaps at vertical junctions
- the timber jamb liners at both garage doors butt against the paving, and there are signs of softness and decay at the bottom of the timber
- the cut out section of the column plinth revealed that timber framing was soaked with water marks and black in colour
- the plaster over the polystyrene to the top of the chimney structure is failing
- many penetrations and fixings through the cladding are poorly sealed
- the ends of apron flashings at roof to wall junctions lack kick outs
- down pipes from the upper roof to lower roofs lack spreaders
- the end of the garage lean-to and the framed decorative triangular projections to the gable above the northern garage door have been clad with butted timber boards, with visible gaps between the boards
- the end of the gutter to the hip roof of the southern garage is turned back to the main wall at the entrance, with the gutter end buried in the cladding. The roof edge above is unflushed and bare framing is visible.

5.4 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 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 medium wind zone
- is a maximum of two storeys high
- has no decks or balconies
- is moderately complex in plan and form, with two different cladding materials and some complex roof to wall junctions
- has eave projections of 480 mm, and verge projections of 250 mm, except for the 1000 mm end of the garage lean-to which has no projection
- has monolithic cladding which is fixed directly to the framing
- has external wall framing that is unlikely to 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 5.3 and in the expert's report as being the:

- lack of vertical control joints particularly in the west and north walls.
- coating, weatherproofing and unsealed cladding under the decorative bands around windows and over the inter-storey junction
- inadequate weatherproofing of the top of the chimney structure
- inadequate weatherproofing of horizontal and vertical junctions between the brick veneer and the monolithic cladding
- lack of clearance from the entrance paving to the base of the cladding
- lack of clearance from the paving to the timber garage door reveals
- inadequate weatherproofing of the entrance columns
- lack of kick-outs to the ends of apron flashings at roof to wall junctions
- lack of spreaders to the down pipes from upper roofs to lower roofs
- inadequate weatherproofing of the garage lean-to and gable ends

- inadequate weatherproofing of the roof to wall junction and gutter adjacent to the entrance
- poorly sealed penetrations and fixing through the cladding.

6.3.2 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 and verge projections over most walls that provide reasonable protection to the cladding areas below them
- the house has no decks or balconies

6.3.3 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.

6.3.4 I note that all elevations of the building demonstrate a medium 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.

## 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 additions to 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 the untreated wall framing may have suffered structural damage from water penetration, and consider that any areas showing signs of past or present leaks should be exposed, investigated and repaired if necessary.
- 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 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, checking of its moisture content should be carried out as part of normal maintenance.
- 7.6 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.
- 7.7 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 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 not issued a notice to fix. 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 23 December 2005.

John Gardiner  
**Determinations Manager**