

# Determination 2006/05

## Refusal of a code compliance certificate for a house with a monolithic cladding system at 19 Te Kowhai Place, Remuera, Auckland

### 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 Graham Mountfort (“the applicant”), and the other party is the Auckland City Council (“the territorial authority”). The application arises because the territorial authority declines to issue a code compliance certificate for a 5-year-old alteration to a 50-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, columns, and beams 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.
- 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 alterations to an existing detached house, situated on an excavated sloping site that is in a medium wind zone in terms of NZS 3604: 1999 “Timber framed buildings”. The resultant two-storey building has a large basement garage area and is of a relatively complex shape on plan. The cedar shingle clad

pitched roofs are set at varying main levels with hip, valley, and wall-to-roof junctions. Curved roofs are formed over the study, the ensuite bedroom and the dormer windows and the upper roof extends over the west elevation deck. These roofs and various other flat roofs have liquid applied membranes. The eaves and verge projections are generally 300mm wide. The exterior walls are of conventional light-timber frame construction built on concrete foundation slabs or new and existing intermediate timber-framed floors and both the new and existing external walls are sheathed with monolithic cladding. Timber-framed monolithic-clad columns and beams support the two new balconies and the roof extensions over them.

- 2.1.2 Two new timber-framed balconies are constructed at the west elevation and both of these have metal balustrades. The larger balcony is constructed for the full length of the wall elevation at the mid-floor level and has a partially cantilevered curved section. A smaller balcony is situated outside the ensuite bedroom and this extends over the larger balcony at the upper level. A timber-framed pergola is formed between two of the columns that support the upper deck. Part of an existing lower floor deck that adjoins the billiard room has been re-paved.
- 2.1.3 The specification requires the wall framing of the house to be H1 treated. However, the applicant has provided documents that show the timber external wall framing to be “ChemFree” and therefore not treated in a way that would be effective in helping resist decay if it absorbs and retains moisture. The expert was unable to verify the treatment, if any, which was applied to the deck framing.
- 2.1.4 The timber-framed external walls, columns and beams of the house, including some of the existing walls that are the subject of this determination are clad with a system that is described as monolithic cladding. In this instance it incorporates 4.5mm thick “Hardibacker” fibre-cement backing sheets fixed over the synthetic building wrap directly to the framing timbers. A 10mm layer of “Duraplast” insulating plaster is applied over the sheets, followed by a fibreglass-reinforced layer of Multiplast plaster and a final “Ezytex” plaster Sponge finish. The cladding was the subject of BRANZ appraisal 309, which has since been withdrawn.
- 2.1.5 Plaster Systems Ltd has provided a “Producer Statement” dated 4 March 2005, and a 15-year “Material Components Guarantee” dated 1 June 2005, both in relation to the cladding system. The licensed Duraplast contractor issued a 5-year “Workmanship Guarantee” dated 1 June 2005 for the cladding. I note that both the guarantees state that no responsibility is taken for consequential damage to any building component that has occurred as a result of the use of untreated framing.
- 2.1.6 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.

2.1.7 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 in November 2000 and carried out various inspections during the construction of the house.

2.2.2 The territorial authority carried out a further inspection of the property on 3 August 2005. In a letter to the applicant dated 10 August 2005, the territorial authority regretted that the house might not comply with the Building Code in a number of respects. The territorial authority attached a notice to fix dated 11 August 2005 to this letter, together with a set of photographs illustrating items of non-compliance. The “Particulars of contravention or non-compliance” attached to the notice to fix listed requirements under the following headings:

1. Issues relating to cladding.
2. Items not installed per the manufacturer's specifications Both “Hardibacker” and “Duraplast”).
3. Items not installed per the relevant acceptable/alternative solutions approved under the building consent.
4. Items not installed per accepted trade practice.
5. Drainage and Ventilation.

2.2.3 The Particulars required the applicant to address and rectify each of the contraventions set out in the Notice.

2.2.4 The applicant made an application for a determination on 29 August 2005.

## **3 The submissions**

3.1 The applicant submitted a covering letter to the Department dated 29 August 2005, which described the building, the cladding, and the builder. The applicant also noted that the house had been lived in since Christmas 2000 and that when the territorial authority inspectors tested the building for moisture, the reading was in the vicinity of 6%.

3.2 The applicant forwarded copies of the:

- plans and parts of the specification
- notice to fix
- correspondence with the territorial authority
- timber supplier’s invoices

- relevant manufacturer's and subcontractor's correspondence and information, including producer statements and warranties.
- 3.3 In a covering letter to the Department dated 22 September 2005, the territorial authority described the Particulars of Contravention.
- 3.4 The territorial authority also forwarded copies of:
- some building consent documentation
  - the notice to fix
  - correspondence with the applicant.
- 3.5 Copies of the submissions and other evidence were provided to each of the parties. Neither the applicant nor the territorial authority made any further submissions in response to the submissions of the other party.
- 3.6 In a letter sent to the owner and the territorial authority on 15 November 2005, the Department expressed concerns about the safety of the decks and the owner responded by a letter dated 21 November 2005. The owner noted that he had instructed the builder to expose the underside of the deck at certain locations. While there were some areas of decay, the owner stated that both decks had steel structural supports, and apart from one small area, the mid-floor deck appeared to be dry. The owner was restricting access to the deck until remedial work had been carried out.
- 3.7 A draft determination was issued to the parties on 12 December 2005. In a letter to the Department dated 22 December 2005, the territorial authority commented on aspects of the draft determination.
- "Over the last year the Department has issued a number of determinations relating to the code compliance of cladding as installed. In Council's experience, the matter in dispute has been inaccurately documented. In practice the matter in dispute is whether the scope of work necessary to achieve code compliance is that documented in Council's Notice to Fix or as identified by the department's assessor. Council's view is that to provide clarity and certainty for the applicant, the matter in dispute should be amended to reflect this. This change would need to be approved by the applicant as well as Council."
- 3.8 In particular, the territorial authority expressed its concern that paragraphs 8.2 and 8.3 indicated by reference a scope of work required to make the house code compliant. The territorial authority recorded its view that this should not part of the determination.

## **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 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 Acceptable Solution E2/AS1, which was in force when this consent was issued, allowed mesh reinforced solid plaster to be applied to fibre cement backing sheets that were face fixed to the framing. 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. I am therefore of the opinion that the cladding system as installed must now be evaluated as 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 expert's report**

- 5.1 The Department commissioned an independent expert ("the expert") to report on the cladding. The expert inspected the cladding of the building on 20 October 2005 and furnished a report that was completed on 27 October 2005. The expert noted that the plaster appeared to be flat, with neat arises, a smooth surface, and consistent use of a base angle. The coating was uniform and generally well adhered with no evidence of a significant level of discolouration. The expert was of the opinion that control joints were not required for a house with the dimensions of the one in question. The expert removed areas of cladding adjacent to one window and found that it was adequately flashed. I am prepared to accept that this example is typical of similar details throughout the house. The expert made the following comments regarding the cladding:
- some areas of the cladding are affected by pinholes
  - there is one large crack at the southwest corner of the house and there are some small cracks at the corners of windows
  - the north wall cladding adjacent to the billiard room is coated but not plastered and there is no significant overlap to the cladding at this location
  - the base of the cladding is finished at or below the paved or ground levels at some locations

- the base of the cladding adjoining some of the balcony decks and the flat roof areas had insufficient clearance above the deck and roofing membranes
- the butyl-rubber flashing to the base of the cladding adjoining the laundry, bedroom 3 dressing room and ensuite is ineffective
- some penetrations through the cladding are inadequately sealed
- With regard to the upper-level balcony, the:
  - glass fibres are visible at the surface of the liquid applied deck membrane
  - metal cap flashing is penetrated by the balustrade fixings
  - tops of the exposed beams and columns lack falls and metal cappings
  - deck drainage outlet is poorly constructed.
- With regard to the mid-level balcony:
  - the glass fibres are visible at the surface of the liquid applied deck membrane
  - there is no clearance between the column cladding and the deck paving
  - the deck membrane is penetrated by the balustrade fixings
  - the downpipes from the deck are plumbed through unsealed upward-facing holes.

5.2 The expert took non-invasive readings through the interior linings of the exterior walls and while the majority of the readings were in the “safe” range, a small number were recorded as being in the “borderline” range. The expert took further invasive readings and following corrected elevated readings were obtained:

- 19.0% at the roof timber of the master bedroom store
- 19.1% at the billiard room bottom plate
- 19.4% at the top of a column at the mid-floor balcony
- 21.2% at the billiard room Harditex strapping
- 22.5% at the master bedroom boundary joist
- 24.5% at a dinette bay joist
- 100.0% at the eating area bottom plate
- 100.0% at a mid-floor balcony joist

- 5.3 Moisture levels above 18% recorded after cladding is in place generally indicate that external moisture is entering the structure. The expert also found areas of water staining and mildew on some of the framing.
- 5.4 The expert also noted that the liquid applied membrane to the curved roofs had areas where the glass fibres were visible at the surface, which indicated that the thickness of the membrane was non-compliant. The stormwater discharging from the curved roof gutters onto the shingle clad roofs below was likely to be entering into the roof framing.
- 5.5 Copies of the expert's report were provided to each of the parties. In a letter to the Department dated 25 August 2005, the territorial authority confirmed receipt of the report but made no further comment on its content.

## **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 the weathertightness characteristics, I find that the house:
- has generally 300mm wide eaves projections plus areas where the roof overhangs the walls, all of which provide some protection to the cladding areas below them
  - is in a medium wind zone
  - is a maximum of three storeys high
  - is of a relatively complex shape on plan
  - has two upper floor balconies
  - has external wall framing that is not likely to be treated to a level that is effective in helping resist decay if it 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, penetrations, and edges are not well constructed. These areas are described in paragraph 5.1, and in the expert's report, as being:

- the areas of the cladding that are affected by pinholes
- the one large crack at the southwest corner of the house and the small cracks at the corners of windows
- the north wall cladding adjacent to the billiard room being coated but not plastered, and the lack of a significant overlap to the cladding at this location
- the base of the cladding being finished at or below the paved or ground levels at some locations
- the base of the cladding adjoining some of the balcony decks and the flat roof areas having insufficient clearance above the deck and roofing membranes
- the ineffective butyl-rubber flashing to the base of the cladding adjoining the laundry, bedroom 3 dressing room and ensuite
- the inadequately sealed penetrations through the cladding
- With regard to the upper-level balcony, the:
  - glass fibres being visible at the surface of the liquid applied deck membrane
  - metal cap flashing being penetrated by the balustrade fixings
  - tops of the exposed beams and columns lacking falls and metal cappings
  - poorly constructed deck outlet.
- With regard to the mid-level balcony:
  - the glass fibres being visible at the surface of the liquid applied deck membrane
  - the lack of clearance between the column cladding and the deck paving
  - the deck membrane being penetrated by the balustrade fixings
  - the downpipes from the deck being plumbed through unsealed upward facing holes.

6.3.2 The expert has pointed out some defects relating to the liquid applied membranes to the balcony decks and to the curved roofs, and also that there is a problem with the stormwater discharging onto the shingle-clad pitched roofs. Accordingly, I

recommend that the territorial authority address these issues in the context of their notice to fix.

- 6.3.3 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 according to reasonable trade practice.
  - The house has 300mm eaves and some additional roof, balcony, and floor projections that provide some protection to the cladding areas below them.
- 6.3.4 These factors can assist the house to comply with the weathertightness and durability provisions of the Building Code.
- 6.3.5 I am concerned that there are high moisture readings at the deck locations and that there is no confirmation that the deck framing has been treated to a level that would help prevent decay if it gets wet. I note also that the owner has pointed out that the deck has steel supports. However, I recommend that the territorial authority thoroughly investigate the construction of the decks and take appropriate action if it has any concerns about the structural and safety considerations relating to them.

## 7 Conclusion

- 7.1 I am satisfied that the current performance of the monolithic cladding on the house is not adequate because it is allowing water penetration into the building at several locations, which could affect the cladding. 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 monolithic cladding faults on the building have already allowed the ingress of water, or will allow the ingress of moisture in the future, it does not comply with the durability requirements of clause B2 of the Building Code.
- 7.3 Subject to further investigations that may identify other faults, I consider that, because the cladding faults identified by the expert occur in discrete areas, I can conclude that satisfactory rectification of the items outlined in paragraphs 6.3.1 and 6.3.2 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, repainting, 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 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 188 of the Act, I hereby determine that the cladding system as installed on the building does not comply with clause E2 of the Building Code. There are also a number of items to be remedied to ensure that it remains weathertight and thus meet the durability requirement of the Building Code. Consequently, I find that the external walls of the house do 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 paragraphs 6.3.1 and 6.3.2 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.
- 8.3 I note that the territorial authority has issued a notice to fix for the house requiring provision for adequate ventilation, drainage and vapour dissipation. Under the Act, a notice to fix can require the owner to bring the building into compliance with the Building Code. The Building Industry Authority had already found in a previous Determination 2000/1 that the Notice to Rectify cannot specify how that compliance can be achieved. I concur with that view. A new 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 dictate how the defects described in paragraphs 6.3.1 and 6.3.2 are to be remedied. That is for the applicant to propose and 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 applicant 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 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 2 February 2006.

John Gardiner  
**Determinations Manager**