

## Determination 2006/129

### Refusal of a code compliance certificate for a building with a monolithic cladding system for the additions to a house at 41 Prospect Terrace, Pukekohe



#### 1 The matter to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004<sup>1</sup> (“the Act”) made under due authorisation by me, John Gardiner, Determinations Manager, Department of Building and Housing (“the Department”), for and on behalf of the Chief Executive of that Department. The applicant is the owner, Warren Bray (“the applicant”), and the other party is the Franklin District Council (“the territorial authority”). The application arises because the territorial authority is not satisfied on reasonable grounds that its cladding systems are code compliant. The territorial authority requested a waiver in regard to the durability of the building elements.

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<sup>1</sup> The Building Act 2004 is available from the Department’s website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

- 1.2 The matter for determination is whether I am satisfied on reasonable grounds that:

**Matter 1: The cladding**

The territorial authority's decision not to accept that the monolithic cladding as installed on the building complied with clauses B2 "Durability" and E2 "External Moisture" of the Building Code (First Schedule, Building Regulations 1992) was correct. By "the monolithic cladding as installed" I mean the components of the system (such as the backing materials, the flashings, the joints and the plaster and/or the coatings) as well as the way the components have been installed and work together.

**Matter 2: The durability considerations**

All other elements incorporated in this building comply with clause B2 of the Building Code, considering the time when the building was constructed. I note that this issue was not initially raised by the applicant, but, at a later date, by the territorial authority as a party to this determination.

- 1.3 In making my decision, I have considered the submissions of the parties, the report of the independent expert commissioned by the Department to advise on this dispute ("the expert"), and the other evidence in this matter.

## 2 The building

- 2.1 The building work involves additions and alterations to an existing single-storey double-brick house with a separate garage ("the additions"), situated on an excavated slightly sloping site that is in a medium wind zone in terms of NZS 3604<sup>2</sup>. The additions consist of a single-storey extension to the west elevation of the house, a two-storey extension to the east elevation of the house, and a carport addition to the garage. The resultant house is of a relatively simple shape on plan but with some complex features. The new external walls are conventional timber framing built on concrete or timber framed floors. The new pitched roofs, which are at varying levels, have hip, valley, and wall-to-roof junctions. The west elevation roof has 600mm wide eaves and verge projections, however, the eaves and verge projections to the south elevation roof are minimal. The roof also extends over the ground floor decks and the upper-level balcony and these extensions are supported on timber or monolithic-clad timber-framed beams and columns.
- 2.2 A new car port is constructed at the end of the existing garage. The additions have an external upper-floor timber-framed balcony situated outside bedroom 1 and the living room, and this is supported on monolithic-clad timber-framed beams and columns that are extended up to support the overhanging roof. The balcony has monolithic-clad timber-framed end balustrades and a metal balustrade to the front. A timber-framed close-boarded deck is constructed at ground level around the east elevation additions. A further deck and a set of adjoining steps are situated outside the main entry and these are tiled and are protected by a metal balustrade.

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<sup>2</sup> New Zealand Standard NZS 3604: 1999 Timber framed buildings.

- 2.3 The building contractor has informed the expert that the timber framing is No1 Kiln Dried. Based on this evidence, I accept that the external wall framing is unlikely to be treated to a level that is effective in helping resist decay if it absorbs and retains moisture.
- 2.4 The wall cladding to the new timber-framed walls and columns is a monolithic cladding system consisting of 4.5mm thick “Hardibacker” fibre-cement backing sheets fixed through the building wrap directly to the framing timbers. The backing sheets are finished with a “Nu-Age” solid plaster system. The existing brick veneer walls are also plastered with the “Nu-Age” system. I note that the original plans show the cladding to the timber-framed walls as “Insulclad” and the territorial authority does not seem to have referred to this amendment.

### **3 Sequence of events**

- 3.1 The territorial authority issued a building consent early in 2001.
- 3.2 The territorial authority carried out various inspections during the construction of the additions, undertaking final inspections on 3 October 2002 and 1 March 2003. The additions passed neither of these inspections.
- 3.3 The territorial authority wrote to the applicants on 1 March 2004, advising that the following matters required attention.
1. Ground levels are too high, must be 225mm, floor to ground – 150mm to pavers.
  2. Plaster cladding must be 50mm above ground.
  3. Ridge capping to be nailed off correctly at every 2<sup>nd</sup> rib.

The territorial authority also noted that recent information had raised doubts about monolithic claddings that did not have certain features, to the extent that they may not satisfy the requirements of B2 and E2. As the cladding in question did not contain these features, the territorial authority required an assurance that it met the requirements of the Building Code before a code compliance certificate could be issued.

- 3.4 The territorial authority did not issue a notice to fix as required under section 164 of the Act.
- 3.5 The application for determination was received by the Department on 28 July 2006.

### **4 The submissions**

- 4.1 The applicant did not make a formal submission but forwarded copies of:
- the plans
  - the letter from the territorial authority dated 1 March 2004, on which handwritten notes by the applicant indicated that the three specific cladding and

roofing issues listed by the territorial authority had been rectified

- a letter from a plasterer dated 19 July 2006, which confirmed that he had carried out the solid plastering to existing walls and that the plaster system to the new timber-framed walls and columns was “lite-weight”. It was also noted that Nu-Age Plaster Ltd’s products were used and that the plasterer is a member of the Auckland Provincial Master Plasterers Association.

4.2 In a letter to the Department, dated 11 August 2006, the territorial authority sought a waiver to the durability period, and said that:

We believe that the dwelling . . . was substantially completed and occupied on 1<sup>st</sup> March 2003.

We contend that any determination made should be subject to a wavier (sic) of the Building Code Clause B2 to the extent that the durability of the dwelling components commence from that date.

4.3 The territorial authority forwarded copies of its inspection reports.

4.4 Copies of the submissions and other evidence were provided to each of the parties.

4.5 A copy of the draft determination was forwarded to the parties on 17 October 2006. The applicant responded in a letter dated 6 November 2006 querying some aspects of the building’s description as set out in the determination. The applicant also stated that temporary post supports have been installed under the eastern elevation deck.

4.6 The territorial authority responded to the draft determination on 16 November 2006, saying that it did not accept the determination as it disagreed with my decision to decline the territorial authority’s request to modify the durability period.

4.7 I have taken the above comments into account and have modified the description of the building. However, I have not changed my decision not to grant a modification of the durability period.

## **Issue 1: The Cladding**

### **5 The expert’s report**

5.1 The expert inspected the cladding of the building on 21 August 2006 and furnished a report that was completed on 24 August 2006. The expert was of the opinion that the quality of work is questionable in some areas.

5.2 The expert also noted that, while one wall was marginally over the length that requires a vertical control joint to be inserted, only minimal cracking of the plaster is evident on this wall.

5.3 The expert removed areas of the plaster to examine the construction below one window, at a balcony column, and at the soffit of a balcony beam. I am prepared to accept that these examples are representative and apply to similar details throughout the additions.

5.4 The expert took non-invasive moisture readings through the interior linings and invasive moisture readings into the exterior of the wall framing, and recorded the following higher invasive readings:

- 23% below a north elevation upper stairwell window
- 23% at two upper-roof barges
- 40% at a balcony beam soffit
- 40% at the bottom of a balcony support column.

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

5.5 The expert also observed heavily decayed timbers at the balcony beam and column inspection points.

5.6 The expert made the following comments regarding the monolithic cladding and the roofing:

- There is some minor cracking at some junctions and where the plaster abuts other building elements.
- There is inadequate ground clearance between the base of the cladding and the paved surfaces at some locations, including at the balcony area.
- The plaster is finished hard onto the timber window sill extensions.
- The plaster to the heads of the exterior joinery units is not formed as shown on the original plans.
- The exterior joinery units lack the sill flashings that are shown on the plans.
- The plaster is not continued behind the verge and barge facing boards, which are also embedded in the plaster.
- The tops of the balcony balustrades lack the required cross-falls.
- The ends of 2 roof barge flashings lack kick-outs.
- The central roof gutter to the upper roof has only one outlet and is not completely sloped to the outfall.

5.7 Copies of the expert's report were provided to each of the parties on 28 August 2006.

## 6 Evaluation For code compliance

### 6.1 Evaluation framework

6.1.1 In evaluating the design of a building and its construction, it is useful to make some comparisons with the relevant Acceptable Solution<sup>3</sup>, in this case E2/AS1, which will assist in determining whether the features of the additions and alterations are code compliant. However, in making this comparison, the following general observations are valid:

- 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.

6.1.2 The approach in determining whether building work is weathertight and durable and is likely to remain so, is to apply the principles of weathertightness. This involves the examination of 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 Department and its antecedent, the Building Industry Authority, have also described weathertightness risk factors in previous determinations<sup>4</sup> (refer to Determination 2004/1 *et al*) relating to cladding and these factors are also used in the evaluation process.

6.1.3 The consequences of a building demonstrating a high weathertightness risk is that building solutions that comply with the Building Code will need to be more robust. Conversely, where there is a low weathertightness risk, the solutions may be less robust. In any event, there is a need for both the design of the cladding system and its installation to be carefully carried out.

### 6.2 Weathertightness risk

6.2.1 In relation to these characteristics I find that these additions:

- are built in a medium wind zone
- are a maximum of two storeys high
- are relatively simple in plan and form but have some complex features
- have minimal eaves or verge projections but have roof extensions that provide good protection to the cladding under them
- have one high-level balcony

<sup>3</sup> An Acceptable Solution is a prescriptive design solution approved by the Department that provides one way, but not the only way, of complying with the Building Code. The Acceptable Solutions are available from the Department's website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

<sup>4</sup> Copies of all determinations issued by the Department can be obtained from the Department's website.

- have external wall framing that is likely to be untreated, so providing little resistance to the onset of decay if the framing absorbs and retains moisture.

6.2.2 When evaluated using the E2/AS1 risk matrix, two of the elevations of the completed house demonstrate a medium weathertightness risk and the remaining elevations a high risk. 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 Discussion

7.1 Taking into account the expert's report, I am satisfied that the current performance of the cladding installed under this consent is inadequate because it has not been installed according to good trade practice. In particular, the cladding is at present allowing water penetration into the walls, through several defects in the cladding. In particular, the cladding demonstrates the key defects listed in paragraphs 5.5 and 5.6. I have also identified the presence of a range of known weathertightness risk factors in these additions. 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 parts of the building covered by this consent are 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 additions to remain weathertight. Because the cladding faults in this building are allowing the ingress of moisture at present, the additions do not comply with the durability requirements of clause B2.

## 8 Conclusion

8.1 I find that, because of the extent and apparent complexity of the faults that have been identified with the 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 applicants are entitled to seek a further Determination

on whether the proposed remedial work will led to compliance with the requirements of clauses E2 and B2.

- 8.2 Effective maintenance of claddings (in particular monolithic cladding) is important to ensure ongoing compliance with clauses B2 and E2 of the Building Code and is the responsibility of the building owner. Clause B2.3.1 of the Building Code requires that the cladding be subject to “normal maintenance”, however, that term is not defined in the Act. The expert has also noted that the roof has not been properly maintained.
- 8.3 I take the view that normal maintenance is that work generally recognised as necessary to achieve the expected durability for a given building element. With respect to the cladding, the extent and nature of the maintenance will depend on the material, or system, its geographical location and level of exposure. Following regular inspection, normal maintenance tasks should include but not be limited to:
- where applicable, following manufacturers’ maintenance recommendations
  - washing down surfaces, particularly those subject to wind-driven salt spray
  - re-coating protective finishes
  - replacing sealant, seals and gaskets in joints.
- 8.4 As the external wall framing of the building is likely not to be treated to a level that will resist the onset of decay if it gets wet and cannot dry out, periodic checking of its moisture content should also be carried out as part of normal maintenance.
- 8.5 I am concerned at the level of decay evident in the balcony support columns and beams. I recommend that the territorial authority urgently inspects the balcony and its supports to ensure its continuing structural stability, and if required, instruct the applicant to carry out any necessary remedial work. I note that the applicant has informed me that additional temporary posts have been installed to support the deck at the present time.

## **9 The Decision**

- 9.1 In accordance with section 188 of the Act, I hereby determine that the building work 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.
- 9.2 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 applicant 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 applicant to propose and for the territorial authority to accept or reject.
- 9.3 I would suggest that the parties adopt the following process to meet the requirements of clause 9.2. Initially, the territorial authority should issue the notice to fix, listing all the items that the territorial authority considers to be non-compliant. The



applicant 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.

## Issue 2: The durability considerations

### 10 Discussion

- 10.1 As set out in paragraph 4.2, the territorial authority has concerns about the durability, and hence the compliance with the building code, of certain elements of the building, taking into consideration the completion date of the building in March 2003.
- 10.2 The relevant provision of clause B2 of the Building Code recognises that building elements must, with only normal maintenance, continue to satisfy the performance requirements of the Building Code for certain periods (“durability periods”) “from the time of issue of the applicable code compliance certificate” (clause B2.3.1).
- 10.3 These durability periods are:
- 5 years if the building elements are easy to access and replace, and failure of those elements would be easily detected during the normal use of the building
  - 15 years if building elements are moderately difficult to access or replace, or failure of those elements would go undetected during normal use of the building, but would be easily detected during normal maintenance
  - the life of the building, being not less than 50 years, if the building elements provide structural stability to the building, or are difficult to access or replace, or failure of those elements would go undetected during both normal use and maintenance.
- 10.4 There appears to have been a 3-year delay between the completion of the house and the applicant seeking a code compliance certificate. The territorial authority has sought a waiver of Clause B2, however, none of the durability periods described in paragraph 10.3, and which could reasonably be expected to commence after the building was effectively completed, have yet expired. With the exception of the roof, (see paragraph 8.2) I have received no evidence to suggest that normal maintenance, as required by Clause B2.3.1 of the Building Code and which might otherwise affect the durability of the elements, has not been carried out.
- 10.5 Consequently I do not believe sufficient time has passed, since the completion of the house in March 2003, to initiate the need for a modification of the durability period as sought by the territorial authority.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 22 December 2006.

John Gardiner  
**Determinations Manager**