

## Determination 2006/114

### Dispute about a code compliance certificate for a building with weatherboard and monolithic cladding systems at 22A Huka Road, Birkenhead



#### 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 applicants are the owners, Mr and Mrs Bray (“the applicants”) and the other party is the North Shore City Council (“the territorial authority”).
- 1.2 The matter for determination is whether I am satisfied on reasonable grounds that:

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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).

### 1.2.1 Matter 1: The cladding

The territorial authority's decision to decline to issue a code compliance certificate for a 5-year-old house because it was not satisfied that the cladding systems as installed to the walls of the house complied with clauses B2 "Durability" and E2 "External Moisture" of the Building Code<sup>2</sup> (First Schedule, Building Regulations 1992) is correct. By "the cladding systems 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.

### 1.2.2 Matter 2: The additional durability considerations

Whether all the building elements installed in the house, apart from those items identified in paragraph 6.3.1 as requiring to be fixed, comply with clause B2 of the Building Code considering the time that has elapsed since the elements were constructed.

- 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 consists of a detached house situated on a steeply sloping east-facing site, which is in a medium wind zone for the purposes of NZS 3604<sup>3</sup>. The house is 2-storeys high on the east elevation, with the upper floor level extending to the west as a single storey wing that steps up the slope to the garage. Construction of the house is conventional light timber frame, with concrete slabs, concrete block foundation and retaining walls, timber subfloor framing, aluminium windows, monolithic cladding to the garage walls and timber weatherboards to other walls. The house is a fairly simple L-shape, with the 5° pitch profiled metal roof forming two monopitched roof planes – one sloping to the east over the two-storey leg, and the other sloping towards the south above the single-storey wing. Rafters are exposed at the eave projections, which vary from gutter width only on the south to more than 1000mm at the recessed entry on the north. Verge projections are about 400mm, and have fake rafters installed under the soffits. A two-sided "box" projects from the dining areas on the upper east wall, and a monolithic-clad "chimney" structure (with sloping shoulders) on the two-storey north wall.
- 2.2 A large deck, with spaced timber slats and open balustrades to the north, is set into the northwest corner of the "L". The ground level to the west of the deck slopes steeply towards the basement, with the wall under the deck clad in monolithic cladding. A second small deck, with spaced timber slats and open balustrades, extends to the north from the basement rumpus room.

<sup>2</sup> The Building Code is available from the Department's website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

<sup>3</sup> New Zealand Standard NZS 3604:1999 Timber Framed Buildings

- 2.3 The expert noted he was advised by the owner that the external framing is untreated. The specification calls for the framing to be boracic treated, but I have received no evidence of any treatment. Given the lack of evidence of any treatment and the date of construction of the house, I consider that the external wall framing of this house is unlikely to be treated.
- 2.4 The cladding system to the garage walls 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 basement wall below the entry deck is clad in painted 4.5mm fibre cement sheet. The remaining walls are clad in stain-finished bevel-backed cedar weatherboards.
- 2.5 I have seen no evidence of producer statements or warranties for the cladding systems.

### **3. Sequence of events**

- 3.1 The territorial authority issued a building consent number BB/00400/01 on 3 April 2001 and carried out various inspections during construction, including a pre-line inspection on 17 July 2001 and post-line on 24 July 2001.
- 3.2 The house appears to have been completed in 2001 although a final inspection was not undertaken until 7 September 2005, when outstanding items and documentation were identified. It appears that the applicants subsequently sought a code compliance certificate, and the territorial authority carried out a visual “weathertightness inspection” on 24 May 2006.
- 3.3 In a letter to the owner dated 14 June 2006, 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 its inspection and consenting process for monolithic claddings had changed since the time the building consent for the house was processed, including the selection of cladding systems to suit the weathertightness risk of the design. The territorial authority listed certain risk factors identified with the building, together with a list of defects and outstanding items; 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.
- 3.4 The territorial authority did not issue a notice to fix as required under section 164 of the Building Act 2004.
- 3.5 On 17 July 2006 the Department received an application for determination from the owners.
- 3.6 The Department sought further necessary information from the territorial authority, which was received on 11 October 2006.

## 4. The submissions

- 4.1 Within the application, the applicants noted that the matters for determination were those outlined in the territorial authority's letter dated 14 June 2006.
- 4.2 The applicant forwarded copies of:
- the records of two inspections
  - the letter from the territorial authority dated 14 June 2006.
- 4.3 The territorial authority made a submission in the form of a letter to the Department dated 10 October 2006, which noted that the matters for determination were:
1. Whether the installed cladding systems comply with clauses B2 and E2 of the New Zealand Building Code.
  2. whether any cladding not remediated complies with clause B2 of the New Zealand Building Code, considering the age of construction.
  3. Whether all other building elements incorporated in this building comply with clause B2 of the Building Code, considering the age of construction.
- 4.4 The territorial authority forwarded copies of:
- the consent drawings and excerpts from the specification
  - the building consent
  - the inspection summary
  - the weathertightness inspection report dated 24 May 2006
  - the letter to the applicants dated 14 June 2006.
- 4.5 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.
- 4.6 A copy of the draft determination was issued to the parties on 18 October 2006. The draft determination was issued for comment and for the parties to agree a date when all the building elements installed in the house, apart from items that have to be fixed as described in paragraph 6.3.1, complied with the Building Code Clause B2 Durability.
- 4.7 In response to the draft the territorial authority nominated 1 October 2001 and the applicant nominated 1 September 2001. The territorial authority's response, dated 15 November 2006, stated that it had agreed a date of 1 October 2001 with the applicant on 27 October 2006. The applicant's response was dated 9 November 2006. No other submissions were made in respect of the draft determination.

4.8 Given the small difference in time between the dates nominated by the parties I have taken the agreed date as being 1 October 2001.

## 5. The expert's report

5.1 The expert inspected the claddings of the building on 7 and 13 September 2006, and furnished a report that was completed on 1 October 2006. The expert noted that the cedar weatherboards appeared generally to be satisfactorily fixed. The expert did not note any cracking to the Harditex walls of the garage. The expert also noted that, although the roof pitch is lower than usually recommended for corrugated metal, there appeared to be no evidence of problems associated with the reduced pitch.

5.2 The expert noted a number of variations from the consent drawings, including:

- the omission of the cantilevered deck to the east elevation
- the addition of a deck to the north wall of the basement
- changes to the top of the chimney structure
- changes to roof overhangs
- the omission of soffit linings, leaving exposed rafters
- the addition of fake rafters at verges.

5.3 The expert noted that metal head flashings were installed above windows and doors, with timber jamb scribes fitted to weatherboard cladding. The expert also said he was advised by the owner that no sill flashings, sill tape or air seals were installed in window joinery. (I note that those features were not required at the time of consent).

5.4 The expert took non-invasive moisture readings through internal linings of exterior walls throughout the house, noting several elevated readings and mould on the lining of the internal wall to the chimney structure. The expert removed a section of lining at skirting level and observed evidence of decay in the bottom plate. Six invasive moisture readings were taken, at the cut-out and through the external wall cladding, at various risky areas and the following elevated readings were recorded in the framing:

- 18% at the bottom of the junction between the garage Harditex and the south wall weatherboards.
- 19% on the side of the garage door on the west wall.
- 20% below the meterbox mounted on the Harditex to the south wall.
- More than 40% and decay at the cut-out to the chimney wall framing.

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

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

- The edges of the roof cladding are not nailed at every second crest.
- The fake verge rafters are inadequately fixed.
- The roof to wall junction above the entry lacks a flashing.
- The east wall to the west roof to wall junction is inadequately flashed and relies on sealant for weathertightness.
- The east upper wall between the upper roof and the lower roof has a timber facing board covering weatherboards joints at the south end, which is reliant on sealant for weatherproofing the junctions.
- The soffit to wall junctions and the exposed rafters at the oblique eaves are inadequately weatherproofed, with no flashings, poor sealants and gaps showing in most areas.
- The wall under the entry deck is clad in inadequate 4.5mm fibre cement, with joints that appear to be installed using stopping compound and paper tape.
- There are cracks in the cladding of the chimney structure, which has inadequate 4.5mm fibre cement backing sheets.
- The top of the chimney structure is inadequately weatherproofed with no top capping, and cracks allowing water to penetrate into the framing.
- Removal of a weatherboard showed that the junctions of the chimney cladding with the weatherboards lack any back-flashing.
- The bottom of the garage Harditex lacks a 6mm anti-capillary gap in some areas, and the clearance to the paving is inadequate beside the garage door.
- The Harditex is painted a darker colour than recommended by the manufacturer.
- Some of the cedar weatherboards on the north elevation lack adequate fixing and are cupping, and a board is missing under the eaves above the master bedroom.
- The meter-box on the garage wall is inadequately flashed and sealed, with a gap showing along the top.
- Light fittings have unsealed fixings, and unsealed cables penetrate the cladding in some areas.

5.6 A copy of the expert's report was provided to each of the parties on 18 September 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>4</sup>, in this case E2/AS1, which will assist in determining whether the features of this house 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>5</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 this house:

- is built in a medium wind zone
- is a maximum of two storeys high
- is fairly simple in plan and form, with two types of wall cladding
- has two attached timber slat decks
- has eaves projections that vary from gutter width only to 1000mm and verge projections of about 400mm

<sup>4</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>5</sup> Copies of all determinations issued by the Department can be obtained from the Department's website.

- has exposed rafters and oblique eaves
- has monolithic and weatherboard cladding that is fixed directly to the framing
- has external wall framing that is not treated to a level that will provide resistance to the onset of decay if the framing absorbs and retains moisture.

6.2.2 When evaluated using the E2/AS1 risk matrix, three elevations of this house demonstrate a moderate weathertightness risk rating and one a low risk rating. 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.

6.2.3 I note that the bevel-backed weatherboard walls of this house fall within the scope of E2/AS1 as not requiring the provision of a drained cavity. I also note that the Harditex cladding to the garage walls is installed to wall faces that are assessed as low risk, and would also not require a drained cavity in order to comply with E2/AS1.

### 6.3 Weathertightness performance

6.3.1 Generally the cladding appears to have been installed in accordance with reasonable trade practice. However, some junctions, penetrations and edges are not well constructed, as described in paragraph 5.5 and in the expert's report. I accept the expert's opinion that work is necessary to fix the following:

- The inadequate nailing at the edges of the roof cladding.
- The inadequate fixing of the fake verge rafters.
- The inadequate weatherproofing of the:
  - roof to wall junction above the entry
  - roof to wall junction between the east wall and the west roof,
  - wall to soffit junction at the oblique eaves and the rafter penetrations
  - junction of the chimney cladding and weatherboards
  - top of the chimney.
- The inadequate cladding under the entry deck.
- The cracks in the cladding of the chimney structure.
- The lack of an anti-capillary gap at the bottom of some of the garage cladding.



- The inadequate clearance from the bottom of the cladding to the paving beside the garage door.
- The missing board, inadequate fixings and cupping to the cedar weatherboards on the north elevation.
- Inadequate weatherproofing of penetrations through the cladding by light fittings and electrical cables, and around the electrical meter box.
- Any other building elements, associated with the above items, that are consequentially discovered to be in need of rectification.

6.3.2 I note the inadequate weatherproofing of the oblique eaves and exposed rafters. In the absence of an appropriately flashed fascia and lined soffit, I am of the view that the penetrations of the exposed roof beams and joists through the wall cannot readily be made to comply with clause B2 of the code.

## Matter 1: The cladding

### 7. Conclusion

- 7.1 I am satisfied that the current performance of the cladding is not adequate because it is allowing water penetration into the building at present. Consequently, I am not satisfied that the cladding systems as installed on the house comply with clause E2 of the Building Code.
- 7.2 I find that fixing the items outlined in paragraph 6.3.1 to the approval of the territorial authority, along with any other associated faults that may become apparent in the course of that work, will consequently result in the house remaining weathertight and in compliance with clauses E2.
- 7.3 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 cladding faults on the building are likely to allow the ingress of moisture in the future, the house does not comply with the durability requirements of clause B2. I have given further consideration to the question of B2 compliance under matter 2 in this determination.
- 7.4 Effective maintenance of claddings (in particular of monolithic claddings) 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.
- 7.5 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.

7.6 As the external wall framing of this house is not 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. The decision**

8.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the cladding 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 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. The notice to fix may list the items to be rectified but it should not specify how compliance is to be achieved as this is for the owner to propose and for the territorial authority to accept or reject. It is important to note that the Building Code allows for more than one method of achieving compliance.

8.3 I would suggest that the parties adopt the following process to meet the requirements of paragraph 8.2. Initially, the territorial authority should issue a 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 detailed 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.

## **Matter 2: The additional durability considerations**

### **9. Discussion**

9.1 As set out in paragraph 4.3, 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 sometime around 2001.

- 9.2 Before addressing these issues I sought clarification of general legal advice about waivers and modifications and the impact on them of the transitional provisions of the Act. I have now received that clarification, which has enabled me to make this determination.
- 9.3 The building appears to have been substantially completed sometime around 2001. The territorial authority made various inspections, including a pre-line inspection on 17 July 2001 and post-line on 24 July 2001. It carried out a final inspection in September 2005 and a visual “weathertightness inspection” in May 2006.
- 9.4 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).
- 9.5 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.
- 9.6 It is not disputed, and I am therefore satisfied that all the building elements installed in the house, apart from items that have to be rectified as described in paragraph 6.3.1, complied with clause B2 in October 2001 (refer paragraphs 4.7 and 4.8).
- 9.7 In order to address these durability issues, I sought some clarification of general legal advice about waivers and modifications I have now received that clarification and the legal framework and procedures based on this clarification are described in previous determinations (refer to Determination 2006/85) and are used to evaluate the durability issues raised in this determination.
- 9.8 I continue to hold that view, and therefore conclude that:
- (a) The territorial authority has the power to grant an appropriate modification of clause B2 in respect of all the building elements installed in the house, apart from items that have to be rectified as described in this determination, if the applicant applies for such a modification.
  - (b) It is reasonable to grant such a modification, with appropriate notification, because in practical terms the building is no different from what it would have been if a code compliance certificate had been issued sometime around 2001.

9.7 I strongly recommend that the territorial authority record this determination and any modification resulting therefrom, on the property file and also on any LIM issued concerning this property.

## **10 The decision**

10.1 In accordance with section 186, I hereby determine:

- (a) that all the building elements installed in the house, apart from items that are to be fixed as described in this determination, complied with clause B2 at 1 October 2001.
- (b) that, should the applicant so request, the territorial authority must modify its decision to issue the building consent to the effect that the building consent is amended as follows:

This building consent is subject to a modification of the Building Code to the effect that clause B2.3.1 applies from 1 October 2001 instead of from the time of issue of the code compliance certificate for all building elements except those elements set out in paragraph 6.3.1 of Determination 2006/114.

- (c) that, once the defects set out in paragraph 6.3.1 of this determination have been fixed to its satisfaction, the territorial authority is to issue a code compliance certificate in respect of the building consent as amended.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 29 November 2006.

John Gardiner  
**Determinations Manager**