

Determination 2006/57

Refusal of a code compliance certificate for building additions with a fibre-cement weatherboard and sheet cladding at 221 Lonely Track Road, Albany, 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 Act¹ 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 Mr Berge (“the owner”), and the other party is the North Shore City Council (“the territorial authority”). The application arises because no code compliance certificate was issued by the territorial authority for the 5-year-old alterations and additions to this house.

1.2 The questions to be determined is whether I am satisfied on reasonable grounds that the wall cladding as installed to the external walls of the building (“the cladding”), complies with the Building Code² (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 coatings) as well as the way the components have been installed and work together.

¹ The Building Act 2004 is available from the Department’s website at www.dbh.govt.nz

² The Building Code is available from the Department’s website at www.dbh.govt.nz

- 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 additions to an existing two-storey detached house situated on a sloping site, which is in a high wind zone for the purposes of NZS 3604³. The building work consists of a split-level two-storey addition which accommodates a double garage, entry and study on the lower levels and new living and dining areas on the upper levels, with alterations made to the existing house to provide a new kitchen and bedroom. Construction is generally conventional light timber frame, with a concrete slab, concrete block foundations and retaining walls, fibre-cement cladding, aluminium windows and a 12° profiled metal roof. The addition is a reasonably simple shape, with the gable roof continuous over the changes in floor level and linked to the existing roof with a series of hips and valleys. The upper east walls are angled to meet at the mid-point of the gable end to provide a recessed tiled timber deck, which is partly located above the garage below. The deck extends around the corner to the north, and has metal and glass balustrades, with a short section of fibre-cement clad barrier separating the western end of the deck from the adjacent lean-to canopy above the entrance. Elsewhere, eaves and verge projections are 450 mm, excluding gutters and fascias.
- 2.1.2 The owner has submitted copies of invoices from the timber supplier indicating that the timber framing supplied was “chem free”. Based on this evidence, I consider that the external wall framing used on the addition is untreated.
- 2.1.3 The upper walls of the addition are clad with “hardiplank” fibre-cement weatherboards. The cladding on lower walls consists of 7.5 mm thick “hardiflex” fibre-cement flat sheets fixed through the building wrap to the framing, with vertical sealant joints and an acrylic paint finish applied over the sheet and the sealant joints.
- 2.1.4 I note that 2 elevations of the new addition demonstrate a moderate 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.
- 2.1.5 Accordingly I consider this face fixed fibre-cement weatherboard and sheet cladding to be an alternative solution (refer to paragraph 4.2).

2.2 Sequence of events

- 2.2.1 The territorial authority issued a building consent for the additions and alterations on 3 November 2000, and carried out various inspections during construction, including

³ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

pre-line and post-line. The building work appears to have been completed during 2001, although the final inspection was not undertaken until 14 June 2004. The territorial authority's inspection record identified a number of outstanding items and noted:

Please arrange for a weathertightness check for the face fixed cladding to the lower level.

- 2.2.2 Following a visual cladding inspection on 7 July 2004, the territorial authority wrote to the owner on 21 July 2004 explaining its concerns about the weathertightness of face fixed claddings without cavities and stating that the Building Code required the building work to remain durable for specific periods of time. The territorial authority also noted that:

As your building is face fixed construction with no cavities we are unable to verify that it fully complies with the Building Code requirements, manufacturer's details applicable at the time and that it will remain durable for the required period.

The territorial authority outlined areas of concern and risks associated with the addition and identified defects, concluding that it could not be satisfied on reasonable grounds that the cladding system complied with clauses E2 and B2 of the Building Code.

- 2.2.3 The territorial authority did not issue a Notice to Rectify as required under section 43(6) the Building Act 1991.
- 2.2.4 The Department received the owner's application for a determination on 30 September 2005.

3. The submissions

- 3.1 The owner noted in the application that the "Matter of doubt or dispute" is:

Weathertightness of cladding on basement level.

- 3.2 In regard to the change in cladding from that specified in the consent documents, the owner also noted:

In 1991 when we fixed the cladding there were already reports circulating about leaking problems with the Hardiflex Monolithic System. We changed to the more flexible Hardiflex with silicone joints to avoid the problems of the Monolithic system.

- 3.3 The owner forwarded copies of:

- the drawings and specification
- the building consent
- the correspondence from the territorial authority
- some of the inspection records

- various invoices, engineering calculations and other statements.
- 3.4 The territorial authority made a submission in the form of a letter to the Department dated 17 October 2005, which summarised the consent and inspection processes related to the building work, and noted that:
- In regards to this application for a determination, the matters of doubt are:
- Whether the installed cladding system complies with clauses B2.3.1 and E2.3.2 of the Building Code.
- 3.5 The territorial authority forwarded copies of:
- some of the consent documentation
 - the inspection records.
- 3.6 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.
- 3.7 A draft Determination was submitted to the parties for comment on 12 December 2005. The owner accepted the draft on 31 May 2006.
- 3.8 The territorial authority accepted the draft but in a fax to the Department dated 3 February 2006 it submitted that paragraph 6.3.1 should include reference to window head flashings being installed without any compensating Inseal foam strip, and that paragraphs 8.3 and 8.4 appeared to be contradictory. I have made no change to the wording of 6.3.1 because I consider the existing wording adequately describes the particular building fault. I have amended paragraph 8.3.

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 that cover the monolithic cladding as installed on this building addition. The cladding is not currently certified under section 269 of the Act. I am, therefore of the opinion that the cladding system as installed must now be considered to be an alternative solution.
- 4.3 In several previous determinations, the Department has made the following general observations, which in my view remain valid in this case, about Acceptable Solutions and alternative solutions:

- Some Acceptable Solutions cover the worst case, so that they may be modified in less extreme cases and the resulting alternative solution will still comply with the Building Code.
- Usually, when there is non-compliance with one provision of an Acceptable Solution, it will be necessary to add some other provision to compensate for that in order to comply with the Building Code.

5. The expert's report

- 5.1 The expert inspected the cladding on 20 October 2005, and furnished a report that was completed on 7 November 2005. The expert noted that the cladding generally appeared to be installed according to the manufacturer's instructions with the cladding "generally straight and flat", although maintenance appeared to be poor with the condition of paint finish "below average". The expert noted that the additions appeared to be "constructed with reasonable care but with some apparent lack of knowledge of the requirements for the installation of the claddings and forming of junctions. The expert removed a small section of sealant between the hardiflex sheets to observe the vertical joint and noted that the joint appeared to be in accordance with the manufacturer's instructions, with sealant well-bonded to sheet edges and in seal tape used under the joint. The expert also removed the scribe at one window jamb to observe the window installation, and the timber capping to the deck barrier to inspect the flashings. I accept that the locations opened are typical of similar locations around the building.
- 5.2 The expert took non-invasive moisture readings at skirting level and under windows throughout the addition, and noted elevated readings near the gas pipe penetration in the south wall of the garage, in the east corner of the lounge, beside the dining room bay window, beside the sliding doors and glass block window of the study. The external claddings outside these areas also recorded high moisture readings, along with the deck soffit linings.
- 5.3 A number of invasive moisture readings were taken through the wall cladding, and the following elevated moisture contents were recorded in the framing:
- 25% to 30% in the hardiflex clad deck barrier
 - 25% to the left of the dining room bay window
 - 26% near the gas pipe penetration in the south wall of the garage
- 5.4 The expert made the following specific comments on the cladding:
- the clearances from the ground to the bottom of the cladding are inadequate in some areas, and the bottom of the hardiflex is unpainted and damaged, with no in seal between the fibre-cement and the concrete as required by the manufacturer's instructions

- the hardiflex under the window jamb scribes is unpainted, with the sheet edges not extending behind the window jamb flanges as required by the manufacturer's instructions
- the timber scribes at the window jambs are not sealed to the hardiplanks
- the ends of the aluminium head flashings have unsealed gaps and unpainted fibre-cement edges exposed
- the frames of the glass block windows are not well-sealed
- a sash in the dining room bay window is ill-fitting, with an open gap showing
- the fixings of the bay window braces and the deck balustrades through the cladding are unsealed
- the top plate of the deck barrier framing has no flashing or other weatherproofing beneath the flat timber capping, and there are signs of water staining, with elevated moisture readings in the deck soffit lining below
- the outer edge of the deck membrane lacks a drip edge and the junction with the wall is poorly weatherproofed, allowing water to penetrate behind the hardiplanks into the garage south wall below. The membrane-lined drainage outlets from the deck are poorly finished
- the cladding junction at the corner of the garage wall is poorly sealed and damaged, with the hardiflex delaminating where exposed
- there is no evidence of the hardiflex sheets having been sealed prior to installation, and the paint finish is generally in poor condition
- the joints in the hardiplanks are not in accordance with the manufacturer's instructions, and are inadequately sealed with the sealant in poor condition
- the end of the apron flashing at the roof to wall junction of the entrance canopy lacks a kickout, and the downpipe discharging from the upper roof lacks a spreader.

5.5 A copy of the expert's report was provided to each of the parties on 21 November 2005.

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 addition:

- is built in a high wind zone
- is a maximum of two storeys high
- has an enclosed deck with a fibre-cement clad balustrade at one end, which is partially situated above a garage area
- is fairly simple in plan and in form
- has eaves projections of 550 mm overall and verge projections of 470 mm.
- has fibre-cement weatherboard and sheet cladding which is fixed directly to the framing
- has external wall framing that is untreated, 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. However some junctions, edges and penetrations are not well constructed, and these areas are as described in paragraph 5.4 and in the expert's report as being the:

- bottom of the sheet cladding, with unpainted bottom edges, lack of separation from the concrete and inadequate clearances to the ground at some locations
- lack of adequate overlap of the window jamb flanges over the lower wall cladding, and the unpainted fibre-cement under the window scribes
- inadequate weatherproofing of the junction of the window scribe to the fibre-cement weatherboards
- unpainted fibre-cement edges and gaps at the ends of the head flashings
- inadequate weatherproofing of the glass block window frame
- inadequate sealing of the fixings of the deck balustrades and the braces under the bay window

- inadequate weatherproofing of the top of the deck barrier
- lack of drip edges at the edges of the deck membrane and inadequate weatherproofing of the deck outlets and the junction with the weatherboards above the garage south wall
- inadequate weatherproofing of the cladding junction at the corner of the garage
- poor condition of the paint finish
- inadequate weatherproofing of the joints in the fibre-cement weatherboards
- lack of kickouts to the apron flashings at the junction of the canopy roof with the wall of the original house.

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:

- While the cladding generally appears to have been installed to adequate trade practice, the manufacturer's recommended installation details have not always been followed
- the addition is reasonably simple in plan and in form, with few complex junctions
- the addition has eaves and verge projections that provide some protection to the cladding areas below them.

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

7. Conclusion

7.1 I am satisfied that the current performance of the cladding is not adequate because it is allowing significant water penetration into the building addition at a number of locations at present. Consequently, I am satisfied that the cladding system as installed on the building addition does not comply with clause E2 of the Building Code.

7.2 In addition, the building addition 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 building addition to remain weathertight. Because the cladding faults on the building addition are likely to allow the ingress of moisture in the

future, the building addition 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 addition becoming and remaining weathertight and in compliance with clauses B2 and E2.

7.4 Effective maintenance of claddings (in particular of 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.

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 shall 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 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 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 building addition becomes and remains weathertight and thus meets the durability requirements of the Building Code. Consequently, I find that the building addition 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 paragraphs 6.3.1 will consequently result in the house being weathertight and in compliance with clauses B2 and E2. Work to correct these items may expose additional associated defects not yet apparent. All rectification work is to be completed to the approval of the territorial authority.
- 8.3 I note that the territorial authority has not issued a Notice to Rectify. A notice to fix should be issued requiring the owners to bring the house into 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.
- 8.4 I suggest that the parties adopt the following process to meet the requirements of paragraph 8.3. Initially, the territorial authority should issue a notice to fix, listing all the items 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.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 23 June 2006.

John Gardiner
Determinations Manager