Determination 2006/15

Refusal of a code compliance certificate for a building with cladding systems of profiled metal, fibre cement weatherboards, and fibre cement sheet at 34A James Tyler Crescent, Mount Roskill

1. The dispute to be determined

1.1 This is a determination of a dispute under Part 3 Subpart 1 of the Building Act 2004 ("the Act") made under authorisation by me, John Gardiner, Determinations Manager, Department of Building and Housing, for and on behalf of the Chief Executive of that Department. The applicant is Mr Kendrick ("the owner"), and the other party is the Auckland City Council ("the territorial authority"). The application arises because no code compliance certificate was issued by the territorial authority for this 1-year-old 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 Code (see sections 177 and 188 of the Act). By "the 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.

1.3 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 consists of a two-storey detached house situated on a gently sloping site that is about 500 metres from a tidal estuary in a very high wind zone for the purposes of NZS 3604: 1999 "Timber framed buildings". Construction is generally conventional light timber frame, with a concrete slab and foundations, fibre cement weatherboard and sheet cladding, aluminium windows and profiled metal roof cladding. The two storey walls around the northeast stairwell are clad with vertical corrugated metal that is curved around the corner. The house is a moderately complex shape, with the 25^{o} upper roof combining hips and gables and the lower floor projections to the south and west forming 10^{o} lean-tos against upper walls. The upper floor projects above lower walls by about 300 mm on the east elevation and 600 mm on parts of the north and west elevations. Except for short lengths of wall with no overhangs, eaves and verge projections are generally 550 mm excluding gutters and fascias. A deck from the upper floor lounge, with membrane floor and removable spaced timber decking, is recessed into the lower roof on the south elevation. A second deck, with spaced timber decking and timber posts, extends to the north from the dining area.

2.1.2 The owner has submitted a "Treatment Certificate" from the timber supplier, which indicates that the timber framing supplied for this house was H3 treated for the external wall framing and H1.2 for the internal wall framing. The expert commissioned by the Department to inspect the cladding ("the expert") noted that the timber he was able to inspect had markings and an odour that indicated the presence of LOSP treatment. Based on this evidence, I consider that the external wall framing used on this house is H3 LOSP treated.

2.1.3 Except for the corrugated metal stairwell walls and a small area of plywood with battened joints at the entry, the walls of the house are clad with 16 mm thick "Linear" fibre cement weatherboards and 9 mm thick "Hardipanel Titan" fibre cement flat sheets fixed through the building wrap to the framing and finished with two coats of acrylic paint. The Titan cladding is fixed over 3 mm fibre cement spacers. Except at corners, where joints are flush-finished, the Titan cladding has 10 mm vertical expressed joints back-sealed with butyl rubber strips and compressible foam seals.

2.1.4 The builder, D. Owen's Builders Ltd., has provided a builder's warranty for 15 years from the installation date for the fibre cement cladding.

2.1.5 I note that 2 elevations of the house demonstrate a high risk rating, as calculated using the E2/AS1 risk matrix. Accordingly I consider this face fixed fibre cement weatherboard and sheet cladding to be an alternative solution (refer to paragraph 4.2).

2.1.6 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.

2.2 Sequence of events

2.2.1 The territorial authority issued a building consent for the house on 9 December 2003, and carried out various inspections during construction, including pre-line on 16 December 2004. The building work appears to have been completed in March 2005, and the final inspection was undertaken on 14 April 2005. The territorial authority's inspection record identified a number of outstanding items including the requirement for windows to include sill trays.

2.2.2 In a letter dated 25 June 2005, the owner (a registered architect) asked the territorial authority to reconsider the requirement for sill flashings as the house had passed pre-line inspections and the windows had been installed in accordance with the "Window Association of New Zealand's Window Installation Systems" (WANZ WIS) recommendations of 18 October 2002.

2.2.3 The owner applied for a determination, which was received by the Department on 22 September 2005, in regard to the window installation.

2.2.4 On 8 November 2005, the territorial authority conducted a site inspection of the house and issued a Notice to Rectify on 17 November 2005, which outlined a number of defects, including the lack of:

- a grate to the deck outlet
- balustrades to the lounge deck
- flashings to the meter box
- stainless steel deck brackets in a sea-spray zone
- sill flashings to windows
- solid backing to some expressed joints in the Titan cladding
- evidence of adequate durability of the roof cladding materials

2.2.5 The territorial authority also raised concerns regarding the lack of provision for drainage behind the wall cladding, noting that:

> The construction methods used in this building do not allow the water to drain away. There is only limited ability for air circulation in the wall framing to ensure that damp timber can dry out. Additionally no early warning detection system has been installed that will alert the building owner that timber framing is wet.

2.2.6 The owner responded in a letter dated 25 November 2005, supplying information on the adequacy of the roof cladding coating for the position of the house and noting that some items identified by the territorial authority would be remedied.

3. The submissions

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

> The windows were installed into the building without sill flashings. The territorial authority (Auckland City) requires sill flashings to be installed before granting Code Compliance for the building. The owner disputes this requirement on the grounds that the window installations are watertight and comply with the then current Building Code.

3.2 The owner forwarded copies of:

- some of the drawings and specification
- some of the consent documentation
- some of the inspection records
- some of the correspondence with the territorial authority
- WANZ WIS technical information on window installation
- other technical information and various statements.

3.3 The territorial authority forwarded copies of:

- some of the consent documentation
- some of the inspection records.

3.4 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.

3.5 In a letter to the Department dated 7 February 2006, the owner suggested that some minor changes should be made to the draft determination. I have considered these comments and have amended the draft as I consider appropriate.

3.6 In a letter to the Department dated 24 February 2006, the territorial authority commented on aspects of the draft determination. In particular the territorial authority is concerned that paragraphs 8.3 and 8.4 (of the first draft determination). may imply to the applicant the scope of work that is required to make the house code compliant, rather than advice to be accepted or rejected by the territorial authority. The territorial authority also noted:

> 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.

3.7 In response to the territorial authority's letter, I consider that I am entitled to determine whether proposed building work complies with the Building Code, and in fact I have done so in this case. However, my concern in this case is also that the work described in paragraph 6.3.1 may not turn out to be sufficient to achieve compliance, and in any event whether the work has been properly completed and is code compliant is a matter that can only be determined after careful inspection by the territorial authority. I also note that the expert's report provides a comprehensive description of the building's outstanding shortcomings and noted items, described in paragraph 5.4, which should have been detected during the territorial authority's original inspection process.

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 claddings as installed on this building. The claddings are not currently certified under section 269 of the Act. I am, therefore of the opinion that the cladding systems as installed must now be considered to be alternative solutions.

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 6 December 2005, and furnished a report that was completed on 8 December 2005. The expert noted that the cladding generally appeared to be installed according to the manufacturer's instructions with the coating "uniform, well adhered and with no evidence of discolouration". The expert observed that clearances from the cladding to adjacent ground or paving were generally adequate, penetrations appeared well sealed, deck weatherproofing appeared adequate and the roof appeared to be appropriately flashed. The expert noted that the drawings and instructions during construction indicated a "higher level of professional scrutiny during construction than is common". The expert inspected the

window installation in the unlined attic space and noted the presence of air seals and flexible flashing tape over the sill framing. The expert also inspected the seals under the expressed joints, which were visible at the bottom of the Titan cladding. I accept that these locations 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 house, and noted no elevated readings. An additional seven invasive moisture readings were taken through interior wall linings at sample windows and bottom plates, and no elevated readings were noted.

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

- although there is limited cladding clearance at the garage doors, these areas are well drained with some shelter from the projecting upper floor
- while the windows are face-fixed with head flashings but no sill flashings, the jambs are well sealed and the installation appears weathertight
- although back flashings at inter-cladding junctions could not be confirmed, low moisture readings indicate that moisture is not penetrating
- the outlet from the lounge deck lacks any leaf guard
- the meter box lacks flashings but appears to be well sealed and weathertight
- there is a crack at one flush-finished corner joint, which may be due to the lack of tapered edges on the "hardiflex" fibre cement sheet used at corners
- the backing strip in the exposed joints in the Titan above the windows appears to lack solid backing in some locations.

5.4 The expert also made comment on two matters, which I consider worthy of note although they fall outside the scope of the application for determination. Those matters were:

- The absence of a balustrade to the lounge deck
- The use of galvanised deck brackets instead of stainless steel ones. The expert noted that, given the limited exposure of the elevated site to salt spray from the tidal estuary, the galvanised coating might be sufficiently durable.

5.5 Copies of the expert's report were provided to each of the parties.

5.6 In a letter to the Department dated 5 January 2006, the owner noted that:

> The house involved is my own retirement home where I expect to live for the next 20 years, with minimal maintenance. I am a registered architect and considered all aspects of the house, especially the cladding, very carefully before proceeding.

5.7 The owner included construction details of cladding corners, and commented on various aspects of the expert's report, including the following points:

- The house has H3 treated timber, ample overhangs and was built by skilled tradespersons.
- Some Titan joints above windows have timber studs on one side only, leaving some 100 mm joint lengths unsupported on one side. Most of these are well sheltered by eaves, but those that are not will be redone.
- The width of the corner harditex is never more than 1200 mm, which gives these panels the same properties as the Titan, so that the paint colour required for monolithic finishes does not apply in this situation.
- The inter-cladding junctions are all at internal corners and have galvanised back flashings as shown in the construction details.
- The cracked joint is very minor and easily remedied.
- The deck balustrade has been ordered and will be installed shortly.

5.8 The owner noted in a further submission of 12 January 2006 that those penetrations not completely sheltered by the roof soffit were visible easily and accessible for maintenance. The pipe and meter box penetrations are well sealed and waterproof and the seal around the pipe photographed in the report has since been painted.

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 taken these comments into account in this determination.

6.2 Weathertightness risk

6.2.1 In relation to these characteristics I find that the building:

- is built in a very high wind zone
- is a maximum of two storeys high
- has an enclosed deck, which is situated above a garage area
- is fairly complex in plan and in form

- has eave projections of 650 mm overall and verge projections of 550 mm above most walls, with upper floor projections above some lower wall areas
- has fibre cement weatherboard which is fixed directly to the framing
- has fibre cement sheet cladding which is fixed over 3 mm spacers
- has external wall framing that is treated, so providing good 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 good trade practice. However some junctions, edges and penetrations are not well constructed, and these areas are as described in paragraph 5.3 and in the expert's report as being the:

- lack of leaf guard to the deck outlet
- crack in an external corner joint
- lack of solid backing to some exposed joints above windows.

6.3.2 I accept that the windows complied with WANZ WIZ recommendations at the time of installation and show no evidence of associated moisture penetration at present, with the framing appearing to be well protected by wrap, flexible flashing tape and air seals. I therefore consider the window installation to be adequate.

6.3.3 I accept that adequate flashings have been installed behind the internal corner junctions of the cladding.

6.3.4 I accept that the meter box has been adequately sealed with no indication of moisture penetration, and consider that if the sealant is well maintained the meter box will continue to remain weathertight.

6.3.5 Notwithstanding the fact that the claddings are fixed directly to the timber framing, thus inhibiting drainage and ventilation behind the cladding sheets, I have noted certain compensating factors that assist the performance of the cladding in this particular case.

- The cladding generally appears to have been installed to good trade practice.
- The sheet cladding is over a small cavity that will provide some limited drainage to the back of the sheets.
- The building has upper floor, eave and verge projections that provide reasonable protection to the cladding areas below them.
- The building has framing that is treated to a level that will provide good resistance to the onset of decay if the framing absorbs and retains moisture.

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

6.3.7 I note the expert's comments (see paragraph 5.4) on the absence of a balustrade to a deck, and the use of galvanised deck brackets. I strongly recommend that the territorial authority investigates these matters to ensure that the safety and structural durability of the house is satisfactory.

7. Conclusion

7.1 I am satisfied that the current performance of the cladding is adequate because it is preventing water penetration into the building at present. Consequently, I am satisfied that the cladding system as installed on the building complies with clause E2 of the Building Code.

7.2 In addition, the building is also required to comply with the durability requirements of clause B2. Clause B2 requires that a building continues to satisfy all the objectives of the Building Code throughout its effective life, and that includes the requirement for the building to remain weathertight. Because the cladding faults on the building are likely to allow the ingress of moisture in the future, the building 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 remaining weathertight and in compliance with clauses B2 and E2.

7.4 I note that effective maintenance of 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 checking, cleaning, re-painting, replacing sealants, and so on.

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 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 complies with clause E2 of the Building Code. There are a number of items to be remedied to ensure that the building remains weathertight and thus meets the durability requirements of the Building Code. Consequently, I find that the building does not comply with clause B2. Accordingly, I confirm the territorial authority's decision to refuse to issue a code compliance certificate.

8.2 I also find that rectification of the items outlined in paragraph 6.3.1, to the approval of the territorial authority, along with any other faults that may become apparent in the course of that work, is likely to result in the building remaining weathertight, and in compliance with clause B2.

8.3 I note that the territorial authority has issued a notice to fix, which includes a requirement to provide ventilation to the wall framing. The territorial authority should now withdraw this and issue a new notice to fix requiring the owner to bring the cladding into compliance with the Building Code, without specifying the features that are required to be incorporated. It is not for me to decide directly how the defects are to be remedied and the cladding brought to compliance with the Building Code. That is a matter for the owner to propose and for the territorial authority to accept or reject.

8.4 I would suggest that the parties adopt the following process to meet the requirements of paragraph 8.3. Initially, the territorial authority should issue 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 technically robust proposal as to the rectification or otherwise of the specified issues. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

8.5 Finally, I consider that the cladding will require on-going maintenance to ensure its continuing code compliance.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 7 March 2006.

John Gardiner
Determinations Manager