

Determination 2005/154

Refusal of a code compliance certificate for a house with a “monolithic” cladding system at 4/44 Allendale Road, Mount Albert, Auckland – House 127

1 The dispute to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004 (“the Act”) made under due authorisation by me, John Gardiner, Determinations Manager, Department of Building and Housing, for and on behalf of the Chief Executive of that Department. The applicants are the two joint-owners, Mr and Mrs Beer acting through the builder (“the owner”), and the other party is the Auckland City Council (“the territorial authority”). The application arises from the refusal by the territorial authority to issue a code compliance certificate for a 2-year-old house unless changes are made to its monolithic cladding systems.
- 1.2 The question to be determined is whether on reasonable grounds the monolithic wall cladding as installed to the timber-framed external walls, columns, and beams of the house (“the cladding”), complies with the Building Code (see sections 177 and 188 of the Act). By “the monolithic wall cladding as installed” I mean the components of the system (such as the backing sheets, the flashings, the joints and the plaster and/or the coatings) as well as the way the components have been installed and work together.
- 1.3 In making my decision, I have not considered any other aspects of the Act or the Building Code.

2 Procedure

2.1 The building

- 2.1.1 The building is a two-storey house situated on a level site in an undefined wind zone. The external walls of the house are of conventional light timber frame construction

built on a concrete “Raftfloor” slab and sheathed with monolithic cladding. The house is of a fairly simple shape on plan, but with some complex features, and the steeply pitched roofs at two main levels have hip, valley, and wall to roof junctions. Apart from the 160mm wide projections to the north and west elevations, there are no eaves or verge projections. The first floor of the house oversails the main entrance and projects over the lower floor at the north elevation. The floor projections are supported on monolithic-clad timber-framed columns. Several of the upper floor windows have arched heads, and four of these windows are set into the roofline and have dormers constructed around them.

- 2.1.2 A large external deck with a curved perimeter is constructed at first floor level, and the first floor projection and the deck are supported on timber-framed and monolithic-clad beams and columns. A flat-pitched roof, which is supported by timber-framed and monolithic-clad columns, completely covers the deck. A metal balustrade protects the deck perimeter.
- 2.1.3 I have not received written evidence as to the type of treatment, if any, that was applied to the framing timber used in the external walls.
- 2.1.4 The timber-framed external walls, columns, and beams of the house that are the subject of this determination are clad with a system that is shown on the plans to be Plaster Systems Ltd “Thermoclad” monolithic cladding. This system incorporates 60mm thick polystyrene sheets, which are back grooved and fixed through the building wrap directly to the framing timbers. A multi-coat, mesh-reinforced textured plaster is applied over the sheets. I note that the plans describe the cladding as being “Duraplast” solid plaster over 4.5mm Hardibacker. I have not seen any evidence that the building consent was amended to accommodate this change of cladding.

2.2 Sequence of events

- 2.2.1 The territorial authority issued a building consent on 6 August 2002. The consent noted that monolithic claddings required regular inspection and maintenance.
- 2.2.2 The territorial authority carried out various inspections during the construction of the house. The plastering inspection was passed on 21 January 2003, and the post-line inspection was passed on 31 March 2003.
- 2.2.3 The territorial authority carried out a site inspection on 21 April 2004. In a letter to the owner dated 3 May 2004, the territorial authority regretted that the building might not comply with the Building Code in a number of respects. The territorial authority attached a Notice to Rectify also dated 3 May 2004 to this letter, together with a set of photographs illustrating items of non-compliance. The “Particulars of Contravention” attached to the Notice to Rectify listed requirements under the following headings:
1. Items not installed per the manufacturer's specifications.
 2. Items not installed per the acceptable solutions of the Building Code (no alternative solutions had been applied for).
 3. Items not installed per accepted trade practice.

4. Ventilated cavity system.
- 2.2.4 The Particulars of Contravention also said that the owner was required amongst other items to:
1. Provide adequate ventilation to the monolithic cladding and into the wall frame space by means of either a ventilated cavity or alternative approved system, and ensuring all issues related to the above are resolved...
- 2.2.5 Plaster Systems Ltd wrote to the builder on 13 May 2004, noting that it had carried out a site inspection on 11 May 2004. The company responded to the points raised in the Notice to Rectify, including the ground clearances, window flashings, dormer window heads, and sealants. The company considered that as the cladding has grooves the requirement for a ventilated cavity was a non-issue, as was the comment regarding the weathertightness of the cladding. The company was confident that once minor remedial work had been undertaken, the cladding, which was applied by one of the best licensed applicators in Auckland, would be code compliant.
- 2.2.6 The territorial authority wrote to Plaster Systems Ltd on 19 May 2004 and reiterated its concerns in response to the comments raised by the company.
- 2.2.7 The builder sent an email to the territorial authority dated 25 May 2004 (but apparently sent on 11 June 2004) and stated that as far as the builder was concerned, the question of the deck cladding base clearance was not an issue. The gap between the sill flashings and the cladding would be cleared and if ultimately required, flexible flanges would be inserted at cladding penetrations. The builder's main area of concern was the territorial authority's insistence on a cavity, as even without the back grooves, this type of cladding had shown itself to be fully functional.
- 2.11 The territorial authority wrote to Plaster Systems Ltd and to the builder in response to a letter sent to the territorial authority by Plaster Systems Ltd on 6 June 2004. The territorial authority set out its procedures relating to a Notice to Rectify and the issuing of a code compliance certificate. The territorial authority stated that more extensive knowledge of cladding systems had led Plaster Systems to introduce a full cavity system in April 2003, which was approximately when the house was completed.
- 2.12 The owner applied for a determination on 20 February 2005.

3 The submissions

- 3.1 In a covering letter to the Department dated 20 February 2005, the owners gave a brief background to the dispute and identified the owners, the builder, the cladding system and the plasterer.
- 3.2 The owner also forwarded copies the correspondence with the territorial authority, the builder, and the cladding supplier.

- 3.3 In a covering letter to the Authority dated 15 April 2005, the territorial authority described the Particulars of Contravention and the specific construction defects.
- 3.4 The territorial authority also forwarded copies of:
- the plans and specifications
 - the consent documentation
 - some of the territorial authority's inspection records
 - the Notice to Rectify
 - correspondence with the owner, the builder and the cladding supplier.
- 3.5 Copies of the submissions and other evidence were provided to each of the parties.
- 3.6 In a letter to the Department dated 2 November 2005, the territorial authority commented on aspects of the Draft Determination. In particular, the territorial authority is concerned that paragraphs 8.3 and 8.4 indicate a scope of work required to make the house code compliant. The territorial authority claims that this is not part of the determination.

4 The relevant provisions of the Building Code

- 4.1 The dispute for determination is whether the territorial authority's decision to refuse to issue a code compliance certificate because it was not satisfied that the cladding complied with clauses B2 and E2 of the Building Code (First Schedule, Building Regulations 1992) is correct.
- 4.2 There are no Acceptable Solutions that have been approved under section 22 of the Act or section 49 of the Building Act 1991 that cover this cladding. The cladding is not 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 in less extreme cases they may be modified and the resulting alternative solution will still comply with the Building Code; and
 - Usually when there is non-compliance with one provision of an acceptable solution, it will be necessary to add some other provision to compensate for that in order to comply with the Building Code.

5 The expert's report

5.1 The Department commissioned an independent expert ("the expert") to inspect and report on the cladding. The expert inspected the building on 16 June 2005, and furnished a report that was completed on 20 June 2005. It noted that the quality of finish is generally good, the plaster finish is smooth, the coating is uniform, well adhered and there is no evidence of discolouration or cracking. The expert removed the plaster coating to reveal the window perimeter details at two locations, and noted that the windows were fully flashed and installed in accordance with the manufacturer's recommendations at the time of installation. However, the standard flashings do not deflect leaks that could arise in the windows themselves. The expert was of the opinion that control joints were not required for a house with the dimensions of the one in question, and there was no evidence of stress in the cladding. The expert also made the following comments regarding the cladding.

- There is inadequate clearance between the base of the cladding and the roofing at the dormers and the garage roof/west wall junction.
- The membrane termination and the plastic base angle at the dormer roof are ineffective.
- The membrane overhang to the dormer roofs is ineffectively sealed to the cladding.
- There are no "kickouts" to the ends of the apron flashings at the dormers and the garage roof/west wall junction.
- There are no flexible flanges on the penetrations through the cladding.
- With regard to the deck:
 - The straps over the cuts in the membrane outside the columns are not fully adhered to the main membrane.
 - There is inadequate ground clearance at the base of the cladding to the columns, the post between 2 doors, and at the east end of the deck.
 - The balustrade is fixed directly through the membrane and there is a risk of leakage at the fixing locations.
 - The timber-edging strip to the membrane is not sufficiently substantial.

5.2 The expert also noted that the ground clearances were less than those indicated in E2/AS1, but concluded that the clearances to the cladding demonstrated adequate code compliance.

5.3 The expert took non-invasive readings at the interior linings of the exterior walls and all the readings were in the "safe" range. A further 8 invasive readings were taken into the exterior wall framing, and these varied from 9.8% to 16.2%. Moisture levels

above 18% recorded after cladding is in place generally indicate that external moisture is entering the structure. The expert noted that the readings were taken after a long dry period. The expert also examined the timber fragments extracted from the invasive testing and found no evidence of possible damage.

- 5.4 Copies of the expert's report were provided to each of the parties. There was no response from the owner and the territorial authority acknowledged receipt of the report in a letter to the Department dated 1 July 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 the weathertightness characteristics, I find that the house:
- has no eaves or verge protection to the cladding, apart from two locations with 160mm wide eaves or verge projections that provide some protection to the cladding areas below them
 - has first floor projections and a roof over the deck that afford excellent weather protection to the claddings below them
 - is in an undefined wind zone
 - is two storey high
 - is of a fairly simple shape on plan, but with some complex features, and has roofs with hip, valley, and wall to roof junctions
 - has one large external deck
 - has cladding with grooves in the back of the backing sheets, which provide some drainage facility

- has external wall framing that is unlikely to be treated to a level that would help prevent decay if it absorbs and retains moisture.

6.3 Weathertightness performance

6.3.1 Generally, the cladding appears to have been installed according to good trade practice and to the manufacturer's instructions, but some junctions, edges, and penetrations are not well constructed. These areas are described in paragraph 5.1, and in the expert's report, as being:

- the inadequate clearance between the base of the cladding and the roofing at the dormers and the garage roof/west wall junction
- the ineffective membrane termination and plastic base angle at the dormer roof membranes
- the ineffectively sealed membrane overhang to the dormer roofs over the cladding
- the lack of "kickouts" to the ends of the apron flashings at the dormers and the garage roof/west wall junction
- the lack of flexible flanges to the penetrations through the cladding
- the issues relating to the deck.

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 find that there are compensating factors that assist the performance of the cladding in this particular case.

- The cladding generally appears to have been installed according to good trade practice.
- The cladding has grooves in the back of the backing sheets, which provide some drainage facility.

6.3.3 I consider that these factors help compensate for the lack of a drainage and ventilation cavity, other than the drainage capacity provided by the grooved cladding, and can allow the house to comply with the weathertightness and durability provisions of the Building Code.

6.3.4 I also accept that, while the ground clearances do not fully comply with the requirements of E2/AS1, in this instance the difference is minimal, and consequently they can be considered compliant.

6.3.5 I note that all elevations of the house demonstrate a moderate weathertightness risk rating as calculated using the E2/AS1 risk matrix. The matrix is an assessment tool that is intended to be used at the time of application for consent, before the building

work has begun and, consequently, before any assessment of the quality of the building work can be made. Poorly executed building work introduces a risk that cannot be taken into account in the consent stage, but must be taken into account when the building as actually built is assessed for the purposes of issuing a code compliance certificate.

7 Conclusion

- 7.1 I consider that the expert's report establishes there is no evidence of external moisture entering the house, and accordingly, that the monolithic cladding does comply with clause E2 at this time.
- 7.2 However, 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 house to remain weathertight. Because the cladding faults on the house are likely to allow the ingress of moisture in the future, the house does not comply with the durability requirements of clause B2.
- 7.3 I also consider that because the faults in the house cladding occur in discrete areas, I am able to conclude that rectification of the identified faults will consequently bring the cladding into compliance with the Building Code. Once the cladding faults listed in paragraph 6.3.1 have been satisfactorily rectified, this house should be able to remain weathertight and thus comply with both clauses E2 and B2.
- 7.4 I note that effective maintenance of monolithic claddings is important to ensure ongoing compliance with clause B2 of the Building Code. That maintenance is the responsibility of the building owner. The Building Code assumes that the normal maintenance necessary to ensure the durability of the cladding is carried out. For that reason clause B2.3.1 of the Building Code requires that the cladding be subject to "normal maintenance". That term is not defined and I take the view that it must be given its ordinary and natural meaning in context. In other words, normal maintenance of the cladding means inspections and activities such as regular cleaning, re-painting, replacing sealants, and so on.
- 7.5 It is emphasized that each determination is conducted on a case-by-case basis. Accordingly, the fact that a particular cladding system has been established as being code compliant in relation to a particular building does not necessarily mean that the same cladding system will be code compliant in another situation.
- 7.6 I decline to incorporate any waiver or modification of the Building Code in this determination.
- 7.7 In response to the territorial authority's letter to the Department of 2 November 2005, 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,

the question of whether the work has been properly completed and is code compliant requires careful inspection.

7.8 The Notice to Rectify issued on 3 May 2004 listed Particulars of Contravention that included:

- cappings
- sill junctions
- flashings
- ground clearances
- penetrations.

7.9 These building defects are issues unrelated to the question of a cavity that the territorial authority has raised. It can be seen that the expert's report provides the comprehensive description of the building's outstanding shortcomings.

8 The decision

8.1 In accordance with section 20 of the Act, I determine that the house is weathertight now and therefore the cladding complies with clause E2. However, as there are a number of items to be remedied to ensure it remains weathertight and thus meets the durability requirements of the Building Code, I find that the house does not comply with clause B2. Accordingly, I confirm the territorial authority's decision to refuse to issue the 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, will consequently result in the house being weathertight and in compliance with clauses B2 and E2, notwithstanding the lack of a ventilated cavity.

8.3 I note that the territorial authority has issued a Notice to Rectify requiring provision for adequate ventilation, drainage and vapour dissipation. Under the Act, a notice to fix can require the owner to bring the house into compliance with the Building Code. The Authority has already found in Determination 2000/1 that the Notice to Rectify cannot specify how that compliance can be achieved. I concur with that view. A new notice to fix should be issued that requires the owners to bring the cladding into compliance with the Building Code, without specifying the features that are required to be incorporated. It is not for me to dictate how the defects as described in paragraph 6.3.1 are to be remedied.

8.4 I would suggest that the parties adopt the following process to meet the requirements of paragraph 8.3. Initially, the territorial authority should issue the notice to fix, listing all the items that the territorial authority considers non-compliant. The owner

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.

- 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 25 November 2005.

John Gardiner
Determinations Manager