Determination 2006/113

Refusal of a code compliance certificate for a building with a monolithic cladding system at 52 Luckens Road, West Harbour

1. The dispute to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004[1] ("the Act") made under due authorisation by me, John Gardiner, Determinations Manager, Department of Building and Housing (the Department"), for and on behalf of the Chief Executive of that Department. The applicant is the owner Mr Hughes ("the applicant") and the other party is Waitakere City Council ("the territorial authority").

1.2 The dispute for determination is whether the territorial authority's decision to decline to issue a code compliance certificate for a 3-year-old house because it was not satisfied that the monolithic cladding to the walls of the house complied with clause

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

E2 "External Moisture" of the Building Code[2] (First Schedule, Building Regulations 1992) is correct.

1.3 The question to be determined is whether I am satisfied on reasonable grounds that the monolithic wall cladding as installed to the walls of the building ("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 materials, the flashings, the joints and the coatings) as well as the way the components have been installed and work together.

1.4 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 (refer paragraph 4.5), and the other evidence in this matter. I have evaluated this information using a framework that I describe more fully in paragraph 6.1. I have not considered any other aspects of the Act or the Building Code.

2. The building

2.1 The building work consists of a detached house situated on a sloping site, which is in a moderate wind zone for the purposes of NZS 3604[3]. The house is one storey high on the southwest and northwest elevations and two-storeys high on the other elevations. Construction is conventional light timber frame, with a concrete slab and foundations, concrete block retaining walls, aluminium windows and monolithic wall cladding. The house shape is reasonably simple, with a 24^{o} pressed metal tile hip roof, and eaves projections of about 600mm. A small gable extends from the roof to form a 2-storey high entrance canopy, which is supported by monolithic-clad circular columns. A monolithic-clad chimney structure extends through the eaves on the north elevation.

2.2 A large deck, with a membrane floor and metal balustrades, extends along the east elevation above the basement garage. The deck is supported by 4 monolithic-clad circular columns set onto square raised concrete bases. The columns have decorative monolithic capitals and plinths that incorporate circular and square sections. A smaller deck, with a membrane floor, metal balustrades and timber post supports, extends from the master bedroom on the southeast elevation.

2.3 The specification describes the wall framing as "kiln dried" without any mention of treatment. Based on this evidence and the date of construction, I accept that the external wall framing is unlikely to be treated. The expert has noted that the timber within the monolithic-clad circular columns appeared to be tanalised.

2.4 The cladding system is what is described as monolithic cladding, and is a 40mm "Rockcote" polystyrene system fixed directly to the framing over the building wrap, and finished with an applied textured coating system. The system includes purpose-made flashings to windows, edges and other junctions.

[2] The Building Code is available from the Department's website at www.dbh.govt.nz.
[3] New Zealand Standard NZS 3604:1999 Timber Framed Buildings

2.5 Rockcote Architectural Coatings NZ Ltd provided a 15-year components warranty, and Tui Plastering provided a 5-year "Licensed Plasterer Warranty" for the workmanship. The warranties note the completion of the cladding as 31 January 2003. Skellerup Roofing and Waterproofing provided a 15-year product warranty, dated 20 December 2002, for the deck membranes.

3. Sequence of events

3.1 The territorial authority issued a building consent (ABA 20021058), which I have not seen, on 12 April 2002. It appears that the territorial authority carried out various inspections during the course of construction, including a preline inspection on 15 November 2002.

3.2 According to the applicant, the house was substantially completed and occupied in January 2003, with only minor landscaping work to be completed. Difficulties with the builder apparently delayed the final inspection until March 2006.

3.3 Following a final inspection, the territorial authority wrote to the owner on 13 March 2006 noting a number of items that required attention. The territorial authority also issued a notice to fix (stamped "Draft") dated 15 March 2006. The attached "Particulars of Contravention" noted:

> Monolithic cladding systems without a 20mm cavity, provision for adequate ventilation, drainage, and vapour dissipation will, in the event of leakage and/or the effect of residual moisture, cause irrecoverable damage to the structural elements of the building.
>
> You are required to:
>
> - Provide adequate ventilation to the monolithic cladding and into the wall frame space by means of either a ventilated cavity or alternate approved system; or
> - Remove the monolithic cladding and replace with an approved cladding system . . .

3.4 The applicant subsequently engaged the services of a building consultant ("the consultant") to undertake a moisture assessment of the house in order to establish the performance of the wall cladding.

3.5 A meeting between the applicant, the consultant, the builder and a representative of the territorial authority was held at the site on 29 March 2006. At the meeting, agreement appears to have been reached on the work required to complete the outstanding items identified in the territorial authority's letter of 13 March 2006. During the same meeting the consultant (observed by the territorial authority's representative) took non-invasive moisture content readings of the exterior wall framing, which showed no elevated moisture content with the highest reading recorded at 15%.

3.6 The consultant subsequently completed a report on the house, dated 30 March 2006, in which he concluded that there "was no visual evidence of any cladding failure or moisture ingress".

3.7 In a letter to the territorial authority dated 12 April 2006, the applicant attached the consultant's report, confirmed that all outstanding items identified in the territorial authority's letter of 13 March 2006 had been completed and rechecked by the territorial authority; and requested reconsideration of the cladding, noting:

> … I have done everything you have asked me to do to meet the requirements of Code of Compliance. All parties involved in the recent rectification work have indicated to me that it is a sound and well built house with no moisture issues.

3.8 In a letter to the applicant dated 4 May 2006, the territorial authority attached another notice to fix (also stamped "Draft") dated 4 May 2006, which contained the same "Particulars of Contravention" as the first notice (refer paragraph 3.3). In the letter, the territorial authority stated that it still had concerns and was not satisfied that the cladding complied with clause E2. The territorial authority stated that the applicant could either apply to the Department for a determination or comply with the notice to fix by:

> …the installation of a moisture detection system and subsequent written report showing moisture readings (18% or less) compliant with the New Zealand Building Code requirements.

3.9 The owner's application for a determination was received by the Department on 12 May 2006.

4. The submissions

4.1 In his submission, the applicant set out the history of the house construction and the subsequent moisture investigation by the consultant, concluding:

> I lived in this house for 3 years with my family and we did not experience any issues with moisture. The manufacturers Rockcote and installers have provided a 15 year guarantee on the product. This was provided to council on 22 March 2006. All persons associated with building and inspecting the house have made favourable comment on its quality and soundness.

4.2 The applicant forwarded copies of:

- the floor plans and specifications
- the consultant's report dated 30 March 2006
- a record of the meeting on 29 March 2006
- the notice to fix dated 4 May 2006
- the correspondence with the territorial authority
- the technical information on the cladding
- various warranties, producer statements and other statements.

4.3 The territorial authority made a submission in the form of a letter to the Department dated 26 May 2006, which outlined the history of the project, explained that inspection procedures had changed since the house was constructed and noted:

> In the absence of the additional inspections implemented as a consequence of those changed inspection procedures, and in the absence of a cavity as a second line of defence, the Council does not believe it is able to be satisfied, on reasonable grounds, that the cladding applied to this dwelling will achieve the functional requirements of Clause E2.2 or the performance requirements of Clause E2.3.2 of the Building Code.

4.4 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.

4.5 The Department subsequently commissioned the consultant as the independent expert ("the expert") to advise on this dispute, and to provide additional information on the house to supplement his report to the applicant dated 30 March 2006 (refer paragraphs 1.4 and 3.6).

4.6 A copy of the draft determination was sent to the parties for comment on 17 October 2006. The territorial authority accepted the draft.

4.7 In a letter to the Department dated 25 October 2006, the applicant advised that the draft determination was incorrect in describing the columns in paragraph 7.1 as "deck columns" and not "entrance columns". I have amended the determination accordingly.

5. The expert's report

5.1 The expert undertook a visual inspection of the exterior cladding in June 2006, and furnished a report that was completed on 27 August 2006. In response to the Department's request, the expert provided additional information on ground clearances, the decks, the window installation and the columns.

5.2 The expert noted that the bottom edge of the cladding was protected with a uPVC base moulding in accordance with the manufacturer's instructions, and clearances to paving or ground generally appeared adequate.

5.3 The expert inspected the rear bathroom window, and noted that the installation appeared to accord with the manufacturer's instructions with aluminium head flashings and uPVC jamb and sill flashings. A drainage gap was provided at the sill, and a generous slope to the cladding was provided at the sill recess. The expert was also able to sight uPVC jamb flashings from beneath the sill of the rear door. I accept that these locations are typical of similar locations around the building.

5.4 The expert removed a small section of cladding at the projecting base of several of the circular columns, which revealed saturated timber but no evidence of decay. The expert noted that the timber appeared to be tanalised.

5.5 The expert took invasive moisture readings through the exterior cladding into the framing beneath a deck balustrade and beneath the deck to wall junction. The readings recorded moisture contents of 15% and 14%.

5.6 The expert made the following specific comment on the cladding:

- moisture was penetrating the tops of the columns, which lacked adequate flashings to the decorative capitals. (I note that the expert was advised that remedial work was subsequently carried out and flashings installed)

5.7 The expert also noted that the only area where the clearance from the paving to the bottom of the cladding was reduced is the lower east wall, where the concrete had been cut back and free-draining scoria installed. The expert noted that this area is protected beneath the 2.7m deck overhang.

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

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[4], 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[5] (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.

[4] 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.
[5] Copies of all determinations issued by the Department can be obtained from the Department's website.

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 moderate wind zone
- is a maximum of two storeys high
- is fairly simple in plan and form
- has eaves projections of more than 600mm above all walls
- has two exposed decks at the upper level
- has monolithic cladding that 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.

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

6.3 Weathertightness performance

6.3.1 Generally the cladding appears to have been installed in accordance with good trade practice. However, some junctions are not well constructed, and these areas are as described in paragraph 5.6 and in the expert's report as being the:

- inadequate flashings to the tops of the columns.

6.3.2 I note the expert was advised by the applicant that remedial work has since been carried out to install adequate flashings to the tops of the columns.

6.3.3 I also note the expert's comment in paragraph 5.7, and accept that the reduced clearance to the cladding in the lower east wall is sheltered under the generous deck overhang and is therefore adequate in the circumstances.

6.3.4 I note that the monolithic cladding to the three low-risk elevations of this house does not require a cavity to comply with E2/AS1. With regard to the remaining moderate risk east elevation, notwithstanding the fact that the cladding is fixed directly to the

timber framing, thus limiting drainage and ventilation behind the cladding, I have noted certain compensating factors that assist the performance of the cladding in this particular case:

- The monolithic cladding has generally been installed to good trade practice and in accordance with the manufacturer's instructions.
- The house has eaves that provide good shelter to the walls beneath them.
- There is no evidence of moisture penetration into the wall or deck framing at present, apart from the columns.

7. Conclusion

7.1 I am satisfied that the current performance of the cladding is not adequate because it is allowing some water penetration into the entrance columns at present. Consequently, I am satisfied that the building does not comply 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 house to remain weathertight. Because the cladding faults on the building are likely to continue to allow the ingress of moisture in the future, the house does not comply with the durability requirements of clause B2.

7.3 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 paragraphs 6.3.1 should be expected to result in the building becoming and remaining weathertight and in compliance with clauses B2 and E2. I note (refer paragraph 6.3.2) that the rectification may already have been completed, but I have not received any advice that the territorial authority has inspected and approved the rectification work.

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 building is untreated, periodic checking of its moisture content should also be carried out as part of normal maintenance.

7.7 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.

7.8 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 monolithic cladding system as installed does not comply with clause E2 and consequently B2 of the Building Code. Accordingly, I confirm the territorial authority's decision to refuse to issue a code compliance certificate.

8.2 However, I find that rectification of the item outlined in paragraph 6.3.1 (remedial work to the tops of the columns) will consequently result in the house being weathertight and in compliance with clauses B2 and E2.

8.3 I note that the applicant has advised that remedial work has been satisfactorily completed (refer paragraph 6.3.2). I consider that the territorial authority should issue the code compliance certificate providing the remedial work has been completed to its approval.

8.4 I note that the territorial authority has issued a draft notice to fix that should now be withdrawn. A new notice to fix may be necessary if the territorial authority does not believe the remedial work identified in paragraph 8.3 will comply with the building code.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 27 November 2006.

John Gardiner
Determinations Manager