Determination 2005/158

Refusal of a code compliance certificate for a house with a monolithic cladding system at 73A Atkin Avenue, Mission Bay, Auckland – House 129

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 applicant is the owner Mr Robert Murphy ("the owner"), and the other party is the Auckland City Council ("the territorial authority"). The application arises because the territorial authority declines to issue a code compliance certificate for a 9-year-old house, unless changes are made to its monolithic cladding system.

1.2 The question to be determined is whether I am satisfied on reasonable grounds that the monolithic wall cladding as installed to the timber-framed external walls and columns 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. The territorial authority has not raised any issues regarding the timber weatherboards that make up the balance of the external cladding. However, I have commented on these in this determination.

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 a detached two-storey house, with a large basement garage area, situated on an excavated sloping site that is in a high wind zone in terms

of NZS 3604: 1999 “Timber framed buildings”. The building is of a relatively complex shape on plan and the pitched roofs at two main levels have hip, valley, and wall-to-roof junctions. The eaves projections are generally 170mm wide, plus a 130mm wide gutter, and the roof extends some 2 metres over the entrance and the family room. Dormer windows with low-pitched roofs are set into and project from the high-level roofs and these lack eaves. The exterior walls are of conventional light-timber frame construction built on concrete block work foundation walls or intermediate timber-framed floors and are sheathed with monolithic cladding.

2.1.2 Two timber-framed balconies are constructed at the ends of the house at the top floor level. Both balconies are constructed over habitable spaces and the larger balcony is also set into the roof. Each balcony has a monolithic-clad timber-framed balustrade. A timber-framed deck, which has a curved cantilevered section and a metal balustrade, is situated at the ground floor level and is supported on monolithic-clad timber-framed columns. The columns are extended to support the roof that overhangs part of the deck and similar columns support the lower roof extension over a paved basement level patio. A full-height chimney is built against one wall and set into the roofline. The chimney is constructed with plastered concrete blocks up to the ground floor level and the remainder is monolithic-clad timber-framed.

2.1.3 The owner has produced invoices showing that the wall framing is Boric Treated, which was normal practice at the time.

2.1.4 The timber-framed external walls and columns of the house that are the subject of this determination are clad with a system that is described as monolithic cladding. In this instance it incorporates “Hardibacker” fibre-cement backing sheets fixed through the building wrap directly to the framing timbers. The sheets are finished with a 20mm thick wire mesh reinforced solid plaster over a synthetic building wrap, followed by a final flexible paint system.

2.2 Sequence of events

2.2.1 The territorial authority issued a building consent on 12 September 1996. This consent listed the required inspections, including those that involved the cladding.

2.2.2 The territorial authority carried out various inspections during the construction of the house and carried out further final site inspections of the house on 9 December 2003. The “Final Check List” relating to this final inspection passed all the external elements of the house and noted:

> Cladding non-vented monolithic.

2.2.3 The territorial authority carried out an inspection of the property on 10 February 2004. In a letter to the owner dated 4 March 2004, the territorial authority regretted that the house might not comply with the Building Code in a number of respects. The territorial authority attached a Notice to Rectify also dated 4 March 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/drainage plan 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 alternate approved system, and ensuring all issues relating to the above are resolved.

2.2.5 The builder wrote to the territorial authority on 11 March 2004, responding to some of the issues raised by the territorial authority. The builder also noted that the territorial authority's inspectors had approved all the issues that had been raised and that relevant producer statements could be provided on request. The builder state that the house was now 8-years-old and did not show any evidence of leakage. The basement, which is not painted internally, did not show any sign of dampness.

2.2.6 The territorial authority responded to the builder's submission by letter on 16 March 2004. The territorial authority stated that due to new information becoming available to the building industry, together with a Weathertightness Homes Resolution Service decision, the territorial authority had to judge the house on the latest available information.

2.2.7 The owner made an application for a determination on 21 October 2004.

3 The submissions

3.1 The owner submitted a "Background Information" document, which described the consent and inspection procedures, some of the construction elements and details, and the names of the plasterer and the backing sheet suppliers. The owner also responded to the issues raised by the territorial authority in its Notice to Rectify.

3.2 The owner forwarded copies of the:

- plans and specification
- sketches and photographs showing various cladding details
- consent and inspection documentation
- Notice to Rectify
- correspondence with the territorial authority
- builder's letter to the territorial authority of 11 March 2004

- timber supplier's invoices
- relevant manufacturer's and subcontractor's correspondence and information.

3.3 In a covering letter to the Department (but addressed to the Authority) dated 15 June 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
- building consent and inspection documentation
- Notice to Rectify
- correspondence with the owner.

3.5 Copies of the submissions and other evidence were provided to each of the parties. Neither the owner nor the territorial authority made any further submissions in response to the submissions of the other party.

3.6 In a letter to the Department dated 2 November 2005, the territorial authority commented on aspects of the draft determination:

> "Over the last year the Department has issued a number of determinations relating to the Building 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 particular, the territorial authority is concerned that paragraph 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 decline to issue a code compliance certificate because it was not satisfied that the monolithic cladding complied with clauses B2 and E2 of the Building Code (First Schedule, Building Regulations 1992) is correct.

4.2 The current Acceptable Solution, E2/AS1, allows for solid plaster systems with fibre cement backing sheets, but requires that they be fixed on battens to create a 20mm cavity between the sheet and the framing. The previous acceptable solution E2/AS1, which was in force when this consent was issued, allowed mesh reinforced solid plaster to be applied to fibre cement backing sheets that were face fixed to the framing.

4.3 In several previous determinations, the Department has made the following general observations, which remain valid in this case in my view, 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 Department commissioned an independent expert ("the expert") to report on the cladding. The expert inspected the cladding of the building on 16 August 2005 and furnished a report that was completed on 17 August 2005. The expert noted that the plaster appeared to be flat, with neat arises, a smooth surface, a uniform finish to the control joints, and consistent use of a base angle. The coating was uniform and well adhered with, apart from one small area, no apparent discolouration. The expert was of the opinion that the control joints were functioning correctly. The lack of cracks in the plaster indicated to the expert that a high standard had been met in relation to the plaster material, its mixing, application, and its curing. The expert removed areas of cladding adjacent to one window and found that it was adequately flashed. I am prepared to accept that this example applies to similar details throughout the house.

5.2 The expert made the following comments regarding the cladding:

- the base of the cladding is finished at or below the ground level at the southeast corner and at the entrance. In addition, the tanking detail at these locations is not adequate
- the base of the cladding is sealed at the plaster set-back located at the garage/workshop/laundry area
- the roofing shingles of the bedroom dormers are in contact with the cladding
- at some locations the plaster is finished above the level of the window sill flashings
- the ends of some of the apron flashings lack kickouts
- the tops of two of the monolithic-clad columns lack falls
- there is inadequte sealing between the master bedroom balcony deck and the base of the access doors
- the plaster base angle at the bedroom 1 balcony balustrade has come away

from the cladding

- the living room deck paving and columns are penetrated by balustrade fixings and are not adequately sealed
- the copper balcony balustrade cappings have steel rivet lap fixings and these are showing signs of corrosion.

5.3 The expert took non- invasive readings through the interior linings of the exterior walls and while the majority of the readings were in the "safe" range, a small number were recorded as being in the "borderline" range. The expert took further invasive readings and following corrected elevated readings were obtained:

- 19.1% at the bedroom 1 flooring
- 23.5% at the living room deck column stud
- 23.9% at the family room bottom plate
- 24.1% at the eating area bottom plate
- 26.9% at the deck edge beam
- 27.1% at the bedroom 1 deck stud.

5.4 Moisture levels above 18% recorded after cladding is in place generally indicate that external moisture is entering the structure. The expert also noted that the smooth edge carpet fitting grips are slightly rusty adjacent to the bedroom 1 and 2 deck doors.

5.5 The expert noted that the butyl-rubber membranes to the dormers were not properly dressed into the gutters, the corner folds were ineffective, and the membrane is cracking at the unrestrained corners.

5.6 Copies of the expert's report were provided to each of the parties. In a letter to the Department dated 25 August, the territorial authority confirmed receipt of the report but made no further comment on its content. The owner responded in a letter dated 29 August 2005. He elaborated several items noted in the report but did not offer any evidence to dispute the key findings of the report.

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 generally 300mm wide eaves projections plus two areas where the roof overhangs the walls by 2 metres, all of which provide some protection to the cladding areas below them
- is in a high wind zone
- is a maximum of three storeys high
- is of a relatively complex shape on plan
- has a two upper floor balconies that are constructed over habitable spaces and a first floor partly closed deck at the ground floor level
- has external wall framing that is likely to be treated to a level that is effective in helping resist decay if it absorbs and retains moisture.

6.3 Weathertightness performance

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

- the base of the cladding being finished at or below the ground level at the southeast corner and at the entrance, and the inadequate tanking detail at these locations
- the base of the cladding being sealed at the plaster set-back located at the garage/workshop/laundry area
- the roofing shingles of the bedroom dormers being in contact with the cladding
- the plaster being finished above level of the window sill flashings at some locations
- the lack of kickouts ends to some of the apron flashings
- the lack of falls to the tops of two of the monolithic-clad columns
- the inadequte sealing between the master bedroom balcony deck and the base of the access doors
- the separated plaster base angle at the bedroom 1 balcony balustrade

- the living room deck paving and columns being penetrated by balustrade fixings and the inadequate sealing at these locations

- the corroding steel rivet lap fixings to the copper balcony balustrade cappings.

6.3.2 The expert has pointed out some defects relating to the butyl-rubber membranes to the bedroom dormers and I recommend that the territorial authority address these issues in the context of their rectification.

6.3.3 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:

- the cladding generally appears to have been installed according to good trade practice

- the house has 300mm eaves and some additional roof projections that provide some protection to the cladding areas below them

- the house has external wall framing that is likely to be treated to a level that is effective in helping resist decay if it absorbs and retains moisture.

6.3.4 These factors can assist the house to comply with the weathertightness and durability provisions of the Building Code.

6.3.5 I note that three elevations of the building demonstrate a high weathertightness risk rating and the remaining elevation a very high 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 am satisfied that the current performance of the monolithic cladding on the house is not adequate because it is allowing water penetration into the building at several locations, which could affect the cladding. Consequently, I am not satisfied that the cladding system as installed on the house complies with clause E2 of the Building Code.

7.2 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 monolithic cladding faults on the building have already allowed the ingress of water, or will allow the ingress of moisture in the future, it does not comply with the durability requirements of clause

B2 of the Building Code.

7.3 Subject to further investigations that may identify other faults, I consider that, because the faults that have been identified with this cladding by the expert occur in discrete areas, I am able to conclude that satisfactory rectification of the items outlined in paragraphs 6.3.1 and 6.3.2 is likely to result in the building being weathertight and in compliance with clauses B2 and E2.

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, repainting, 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 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 on the building does not comply with clause E2 of the Building Code. There are also a number of items to be remedied to ensure that it remains weathertight and thus meet the durability requirement of the Building Code. Consequently, I find that the external walls of the house do not comply with clause B2. Accordingly, I confirm the territorial authority's decision to refuse to issue a code compliance certificate.

8.2 In response to the territorial authority's letter to the Department of 2 November 2005, I consider that I am entitled to determine whether the proposed building work proposed by the owner to rectify the defects will likely comply with the Building Code, and I have done so in this case.

8.3 I also find that rectification of the items outlined in paragraphs 6.3.1 and 6.3.2 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.

8.4 I note that the territorial authority has issued a Notice to Rectify for the house requiring provision for adequate ventilation, drainage and vapour dissipation. Under the Act, a notice to fix can require the owner to bring the building into compliance

with the Building Code. The Building Industry Authority had already found in a previous 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 described in paragraphs 6.3.1 and 6.3.2 are to be remedied. That is for the owner to propose and the territorial authority to accept or reject.

8.5 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 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.

8.6 Finally, I consider that the cladding will require ongoing maintenance to ensure its continuing code compliance.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 5 December 2005.

John Gardiner
Determinations Manager