Determination 2005/103

Refusal of a code compliance certificate for a building with a "monolithic" cladding system: House 91

1 THE DISPUTE TO BE DETERMINED

1.1 This is a determination of a dispute referred to the Chief Executive of the Department of Building and Housing ("the Chief Executive") under section 17 of the Building Act 1991 ("the Act") as amended by section 424 of the Building Act 2004. The applicant is the owner Dale Gifford (referred to throughout this determination as the "owner"), and the other party is the Western Bay of Plenty District Council (referred to throughout this determination as the "territorial authority"). The application arises from the refusal by the territorial authority to issue a code compliance certificate for a 9-year-old house, unless changes are made to its monolithic cladding system.

1.2 My task in this determination is to consider whether I am satisfied on reasonable grounds that the external monolithic wall cladding as installed on the majority of the timber framed external walls of the house ("the cladding"), complies with the building code (see sections 18 and 20 of the Act). By "external 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 This determination is made under the Building Act 1991 subject to section 424 of the Building Act 2004. That section came into force ("commenced") on 30 November 2004, and its relevant provisions are:

> ". . .on and after the commencement of this section,—
>
> "(a) a reference to the Authority in the Building Act 1991 must be read as a reference to the chief executive; and
>
> "(b) the Building Act 1991 must be read with all necessary modifications to enable the chief executive to perform the functions and duties, and exercise the powers, of the Authority . . . "

It should be noted that the new legislation does not amend the determination process set out under the 1991 Act, other than to transfer the power to make a determination from the Building Industry Authority ("the Authority") to the Chief Executive.

1.4 This determination refers to the former Authority:

(a) When quoting from documents received in the course of the determination, and

(b) When referring to determinations made by the Authority before section 424 came into force.

1.5 In making my decision, I have not considered any other aspects of the Building Act or the building code.

2 PROCEDURE

The building

2.1 The building work consists of a two-storey detached house situated on a level site in a high wind zone in terms of NZS 3604: 1999 "Timber framed buildings". The house is of conventional light timber frame construction on concrete ground floor slabs, and the majority of the external walls are sheathed with monolithic cladding. The house is of a fairly complex shape, and the pitched roofs have re-cycled clay tile coverings with hip, valley and wall to roof junctions. Apart from 225mm wide eaves extensions to some locations, there are generally no eaves or verge extensions. Extended tiled roofs and specific flat roofs are constructed over porch areas at some locations, and these are supported on timber posts and beams. There are three large dormer windows set into the roofing, and a monolithic-clad timber-framed chimney is constructed against one wall and set into the roofline.

2.2 The specification calls for timber framing to be H1 Boron treated. The owner was unable to provide written evidence, but claims that the timber framing as supplied was Boric treated.

2.3 The building is mainly clad with what is described as monolithic cladding. According to the details supplied by the owner, this cladding is 25 mm thick two-coat solid plaster applied to rib-lathe fixed through a building wrap directly to framing timbers. The plaster is finished with an exterior "Dulux Luxaclad" acrylic waterproof membrane system. The dormer window walls and some gable ends are clad with timber shingles. I note that the plans indicate cedar weatherboards to the locations now clad with shingles.

Sequence of events

2.4 The territorial authority issued a building consent on 21 December 1995. The conditions attached to the consent noted that the territorial authority required notice for a set of inspections, one of which related to the cladding.

2.5 The territorial authority carried out various inspections throughout the construction of the house, and according to the owner, passed a preline building re-inspection on

22 May 1996. The owner also noted that the territorial authority carried out a final building inspection on 25 September 1998 and failed the house. The territorial authority had noted against this inspection: "Gutters and downpipes to be installed, ground levels to be lowered".

2.6 On 8 May 2003, the territorial authority wrote to the owner stating that a staff member intending visiting the site, and that as a result of that visit one of 3 options would transpire.

2.7 On 11 June 2004, the territorial authority wrote to the owner, advising that it declined to issue a code compliance certificate. The territorial authority also said that, as the cladding system was monolithic, the territorial authority was not satisfied, on reasonable grounds, that it would comply with clause E2. The territorial authority went on to state that there were three methods available to achieve code compliance, and the issue of a code compliance certificate. In summary these were:

- Destructive testing /checking where the cladding or internal lining is removed to check the condition of the framing; or
- Removal of the cladding and replacement either with an alternative non-monolithic cladding, or a monolithic cladding with a suitable moisture management scheme; or
- Applying to the Authority for a determination.

2.8 The territorial authority did not issued a Notice to Rectify as required by section 43(6) of the Act.

2.9 The owner applied for a determination on 7 March 2005.

3 THE SUBMISSIONS

3.1 The owner provided copies of:

- The building plans and specification;
- The building consent information;
- Some of the territorial authority's inspection records;
- The correspondence with the territorial authority;
- Invoices from the plasterer and the timber supplier; and
- A drawing showing a cross section of the external walls.

3.2 Copies of the submissions and other evidence were provided to each of the parties.

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 49 of the Act that cover this cladding. 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 for mesh reinforced solid plaster to be applied to fibre cement backing sheets that were face fixed to the framing. The cladding is not currently accredited under section 59 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.

- 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 25 May 2005, and furnished a report that was completed in May 2005. It stated that the stucco finish is generally well done. The paint-on membrane over the windowsill projections has prevented water penetrating into the framing at this time. The expert cut away the plaster at the top corner of one window and at the bottom corner of another window. I am prepared to accept that the details revealed by these investigations are typical of the remaining external joinery units. The expert also noted that certain remedial work had already been undertaken in response to the concerns expressed by the building certifier. The expert's report made the following specific comments on the cladding:

- There are minor vertical and horizontal cracks in the plaster that have been filled in;

- There are no vertical or horizontal control joints in the plaster;

- There is an inadequate finish to the base of the cladding where it has been cut back to provide effective ground clearances;

- The end of the apron flashing above the kitchen window lacks a kick out;
- The external joinery units lack jamb and sill flashings, and the head flashings do not extend past the jambs;
- The garage door opening head flashing is not carried past the jamb linings, and there are no back flashings or jamb flashings installed;
- There is no evidence of a flashings fitted to the beam adjoining the family room rafters where it penetrates the cladding;
- There are no head, jamb, or sill flashings to the timber louvres in the wall above the family room; and
- The shingle cladding to the gables and dormer windows lack corner flashings.

5.2 The expert also noted that the bottom course of the tiled roofing is slipped up at some locations, exposing the underlay, which is perishing. The expert also noted that there was a flashing leak at the ridge over the living room and the roof required some general maintenance.

5.3 The expert carried out a series of 80 moisture tests to the interior of the exterior house walls using a non-invasive meter. All these readings were under 18%, with the following exceptions:

- Two readings of 20% at the living room ceiling level; and
- Two readings of 35% adjacent to the garage door

The expert also took invasive tests at certain locations and the following higher moisture readings were recorded:

- Readings of 19% and 23% adjoining the chimney in the living room;
- A reading of 22% at the ground floor bathroom window frame;
- A reading of 23% adjacent to the garage side door;
- A reading of 25 % at the sill of the window in bedroom 3; and
- Readings of 19%, 28%, and 30% adjoining the garage door;

Moisture levels above 18% recorded after cladding is in place generally indicate that external moisture is entering the structure. The expert also observed water stains or water damage in the family room and in the living room

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

6 DISCUSSION

General

6.1 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 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.

Weathertightness risk

6.2 In relation to these weathertight risk characteristics I find that the house:

- Has, apart from some eaves having 225mm projections, no eaves or verge projections that could protect the cladding below them;
- Has extended roofs over porch areas providing additional protection to the cladding;
- Is built in a high wind zone;
- Is two storeys high;
- Is of a fairly complex form on plan;
- Has no balconies or decks; and
- Has external wall framing that may not be able to resist the onset of decay if it absorbs and retains moisture.

Weathertightness performance

6.3 Generally, the cladding appears to have been installed according to recognized good trade practice, 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 lack of control joints in the plaster;
- The inadequate finish to the base of the cladding where it has been cut back to provide effective ground clearances;
- The lack of a kick out to the end of the apron flashing above the kitchen window;
- The lack of jamb and sill flashings to the external joinery units, and the head flashings not extending past the jambs;

- The garage door opening head flashing not being carried past the jamb linings, and the lack of a back flashing and jamb flashings;
- The lack of a flashings where the beam adjoining the family room rafters penetrates the cladding;
- The lack of head, jamb, or sill flashings to the timber louvres in the wall above the family room; and
- The lack of corner flashings to the shingle cladding to the gables and dormer windows.

6.4 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 house has no balconies or decks; and
- The house has extended roofs over porch areas providing additional protection to the cladding.

6.5 I consider that these factors help compensate for the lack of a drainage and ventilation cavity, and can allow the house to comply with the weathertightness and durability provisions of the building code.

6.6 I also draw the parties' attention to the expert's comments regarding the roof, and recommend that suitable remedial work be undertaken if, on further examination, this is perceived to be a problem.

6.7 I note that one elevation of the house demonstrates a low weathertightness risk rating, two elevations demonstrate a moderate risk, and the remaining elevation demonstrates a high risk 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 cladding is not adequate because it is allowing water penetration into the house in at several locations, which could affect the cladding of the house 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 cladding faults on the house will allow the ingress of moisture in the future, the house does not comply with the durability requirements of clause B2 of the building code.

7.3 I consider that, because the faults that have been identified with this cladding occur in discrete areas, I am able to conclude that satisfactory rectification of the items outlined in paragraph 6.3, together with any roofing remediation, is likely to result in the house being weathertight and in compliance with clauses B2 and E2, notwithstanding the lack of a ventilated cavity.

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 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 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 20 of the Building Act 1991, I hereby determine that the cladding system as installed on the house does not comply with clause E2 of the building code. There are also a number of items to be remedied to ensure that the house remains weathertight and thus meet the durability requirement of the code. Consequently, I find that house 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, together with any roofing remediation, 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 did not issue a Notice to Rectify. The territorial authority should now issue a Notice to Fix, and the owner is then obliged to bring the

house up to compliance with the building code. 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, with either of the parties entitled to submit doubts or disputes to the Chief Executive for another determination.

8.4 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 18 July 2005.

John Gardiner
Determinations Manager