Determination 2005/148

Refusal of a code compliance certificate for a building with a "monolithic" cladding system at 2/37 Deep Creek Road, Torbay – House 123

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 one of the joint-owners Mr L J Hopkins ("the owner"), and the other party is the North Shore City Council ("the territorial authority"). The application arises from the refusal by the territorial authority to issue a code compliance certificate for a 1-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 the monolithic wall cladding as installed to the timber-framed external walls of the house ("the cladding"), complies with the Building Code (see sections 18 and 20 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 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 . . "

1.4 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.

1.5 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.

1.6 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 detached house situated on an excavated sloping site in a low wind zone in terms of NZS 3604. The lower floor contains entry, garage, bedroom and service areas, while the upper floor has living, dining, kitchen and master bedroom areas. The upper floor has an enclosed cantilevered deck, which is partly set back over bedroom spaces below. Construction of the house is conventional light timber frame, with concrete block retaining walls, foundations and a concrete slab. Windows and doors are aluminium, the roof is of profiled metal tiles and walls are sheathed mainly in monolithic cladding, with deck walls and two other small areas in cedar weatherboards. Deck balustrades have monolithic cladding on the outside and cedar weatherboards on the deck face, with a metal capping to the top. The house shape is simple, and the 20° hipped roof provides eave projections from 250 mm to 750 mm, with a 1000 mm overhang above one section of the deck.

2.1.2 The owner has supplied a copy of a letter from the timber supplier, which indicates that boric treated timber has been used for the wall and deck framing of the house but does not state the level of treatment.

2.1.3 The monolithic cladding system is "Harditex", which incorporates fibre cement sheets fixed through the building wrap directly to the framing timbers and finished with a jointing, textured coating and painting system. The manufacturer's instructions include details for flashings at various junctions. For the purposes of this Determination, the manufacturer of the jointing and coating system is regarded as the manufacturer of this cladding system; despite the fact that the fibre cement backing sheets are proprietary to another manufacturer. All coating products and the associated components are supplied by the manufacturer.

2.1.4 The manufacturer issued material and workmanship warranties dated 31 July 2003.

2.2 Sequence of events

2.2.1 The territorial authority issued a building consent on 2 September 2002, based on a certificate provided by a building certifier dated 26 November 2001.

2.2.2 The building certifier made various inspections during construction, and passed the building preline inspection on 17 February 2003. The building certifier approved final inspections on 10 October 2003, and issued a code compliance certificate on 16 October 2003, which covered all building work except for the external wall cladding.

2.2.3 The territorial authority wrote to the owner on 25 August 2004, noting that:

> As Council did not undertake any inspections of the installed cladding system it is unable to be satisfied on reasonable grounds that the installed cladding system complies with the NZ Building Code and therefore cannot issue the Code Compliance (CCC) at this time.
>
> A Building inspector will be required to visit the site and undertake a Final inspection.

2.2.4 Following a site cladding inspection on 2 September 2004, the territorial authority wrote to the owner on 1 October 2004 advising that it was unable to issue a code compliance certificate as it could not be satisfied, on reasonable grounds, that the monolithic cladding would comply with clause E2. The territorial authority described its concerns in regard to weathertightness and durability in regard to monolithic cladding systems, outlined relevant risk factors and noted the following defects in regard to the cladding:

> No flashing above meterbox
>
> Harditex to block retaining wall junction

2.2.5 The territorial authority went on to note the following specific defects in regard to the cladding:

> Much of the drainage gap between the PVC sill tray and aluminium sill flashing is blocked with texture coating. The manufacturer's specifications call for this gap to be 2-3mm.
>
> Paint all exposed silicone.
>
> Fully seal around hose tap.
>
> Cladding to ground clearances to comply with manufacturer's specifications.
>
> Height of floor above finished ground levels to comply with NZS 3604: 1999 and the NZ Building Code.

2.2.6 The territorial authority did not issue a Notice to Rectify as required under section 43(6) of the Act.

2.2.7 The owner applied for this Determination on 3 January 2005.

3 The submissions

3.1 The owner forwarded copies of:

- the building certifier's inspection checklist and code compliance certificate
- plans and specifications
- correspondence with the territorial authority
- a statement from the timber supplier
- cladding coating workmanship and material warranties.

3.2 In a covering letter to the Department dated 14 April 2005, the territorial authority outlined the events leading up the refusal to issue a code compliance certificate, the risk factors and defects for the house, and the matter for the Determination:

> In regards to this application for a Determination, specifically in this case the matter of doubt is:
>
> - Whether the installed cladding system complies with clauses B2.3.1 and E2.3.2 of the Building Code.

3.3 The territorial authority forwarded copies of;

- building consent documentation
- building inspection records
- correspondence with the owner.

3.4 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 approved under section 49 of the Act that cover this cladding. The cladding is not accredited under section 59 of the Act. I am therefore of the opinion that the cladding system as installed can 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 12 May 2005 and furnished a report that was completed on 19 May 2005. The expert noted that the finish to the cladding was generally good. Deck areas were adequately drained with generous cladding clearances, and the metal balustrade cappings have sloped tops, side fixings and sealed lap joints. Service penetrations through the wall cladding were generally well sealed, and the meterbox is sealed and is sheltered under the deck overhang. Ground clearances to the cladding were generally adequate, with paving well drained and sloping away from the walls. The expert removed small sections of coating at vertical and horizontal control joints and noted that these appeared to be generally in accordance with the manufacturer's instructions.

5.2 The expert removed a small section of the coating at the jamb to sill junction of a window to examine the flashings and noted that purpose made uPVC jamb and sill flashings have been installed as shown in the manufacturer's instructions. The doors and windows are fitted with aluminium head flashings, which extend beyond the jambs.

5.3 The expert took interior non-invasive moisture readings of exterior walls throughout the house. All readings were found to be at an acceptable level. More than 30 invasive readings were taken at potentially vulnerable areas in exterior walls, with all readings recorded at 17% or less except in the deck balustrades, where 3 readings of 21% and one of 23% were recorded. Moisture levels above 18% recorded after cladding is in place generally indicate that external moisture is entering the structure.

5.4 The expert made the following specific comments on the cladding.

- The deck overflow penetrations are not well sealed, and moisture contents of 23% and 21% were recorded in the balustrade framing below.

- A drainage pipe from the cantilevered deck shows signs of leaking on the underside of the soffit below.

- There is no drainage gap between the window flange and the windowsill flashing as required by the manufacturer's instructions.

- There is a small section of open metal balustrade filling a cutout in the framed and clad balustrade to the northwest end of the deck. The fixings of the metal

balustrade have not been sealed, and metal cappings to the top and sides of the cut-out appear to have inadequate cover over the cedar weatherboards used on the inside face of the balustrade. Moisture content of 21% was recorded below the corner of the cutout.

- The cedar weatherboards to the inside face of the balustrade are unpainted, and are cracking near the dining room doors. There is also an unsealed gap at the junction with the cedar wall cladding at the other end of the deck. However the area is sheltered and there is no indication of associated water penetration.

- There are 2 wall lengths of about 6000 mm on the south east elevation and one of 6600 mm on the north west elevation that exceed the 5400 mm recommended by the manufacturer as requiring vertical control joints. However, there is no sign of cracking in these longer wall sections.

- The base of the cladding on the right of the garages doors has been cut back to accommodate the sloping paving, reducing the cover over the edge of the concrete while providing 50 mm clearance from the paving. However the area is well drained and there is no indication of moisture entry.

- Cladding clearances to the paving around the entry vary from 0 to 15 mm. However the area is well drained, sheltered by the canopy above and shows no evidence of moisture penetration.

- The lower end of the apron flashing at the right hand side of the entry canopy has been crudely constructed, but appears to be performing adequately.

- The concrete block retaining wall penetrates the cladding beside the garage doors, with the side junctions sealed and the top stepped up by 100 mm to allow the cladding to overlap the concrete. The junction appears weathertight and there is no indication of moisture entry.

5.5 Copies of the expert's report were provided to each of the parties and both accepted 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 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 these characteristics I find that the house:

- is built in a low wind zone
- is a maximum of two storeys high
- is simple in plan and in form, with few complex roof to wall junctions
- has eave projections, varying between 250 mm and 1000 mm, above all walls
- has an enclosed deck, with clad balustrades, set partly over habitable areas
- has external windows and doors that have aluminium head flashings and purpose made uPVC jamb and sill flashings
- has monolithic cladding to most external walls, which is fixed directly to the framing with no drainage cavity
- has treated deck and external wall framing that will offer some 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, but some junctions, edges, and penetrations are not well constructed. These areas are all as described in paragraph 5.2 and in the expert's report as being the:

- poor sealing of the deck overflow penetrations through the balustrades
- sign of leaking from the drainage pipe through the deck
- lack of drainage gaps at window sills
- capping junctions and cover around the cut-out section of balustrade
- cracking and poor sealing of timber weatherboards on the inner face of the balustrade cladding at the junctions with the walls.

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 do not accept that the lack of a drainage and ventilation cavity in itself prevents the house from complying with the weathertightness and durability provisions of the Building Code.

6.3.3 I note the expert's comments regarding the:

- lack of cladding clearance at the entry, and accept that this area is well drained and sheltered by the canopy above

- lack of cover and clearance near the garage doors, and accept that the area is well drained away from the wall

- 3 areas of cladding, without vertical control joints, on lengths of wall that exceed 5200 mm. However, given the relatively small wall lengths, the control joints elsewhere in the walls, the lack of consequential problems after 2 years, and the configuration of wall shapes, I consider that the vertical control joints used for this house should be adequate.

6.3.4 I acknowledge the territorial authority's concern regarding the:

- lack of a top flashing to the meterbox, but consider that the box is adequately sealed with the top protected by the deck overhang above

- cladding to concrete block retaining wall junction, but accept that the junction appears adequately weatherproofed, with no evidence of moisture penetration.

6.3.5 I note that three elevations of the house demonstrate a moderate weathertightness risk rating, and the remaining elevation a low risk 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 constructed 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 deck balustrade framing at several locations at present. Consequently, I am not satisfied that the cladding system as installed complies with clause E2 of the Building Code.

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 in this building 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 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, 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 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 20 of the Building Act 1991, I hereby determine that the monolithic cladding system as installed does not comply with clause E2 of the Building Code. There are a number of items to be remedied to ensure that the house becomes and remains weathertight and thus meets the durability requirements of the Building Code. Consequently, I find that the 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 6.3.1, 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 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 not issued a Notice to Rectify. A 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 are to be remedied. How that is done 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 11 November 2005.

John Gardiner
Determinations Manager