Determination 2005/86

Refusal of a code compliance certificate for a building with a "monolithic" cladding system: House 76

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 J G Stewart Family Trust (referred to throughout this determination as "the owner"), and the other party is the Auckland City 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 4-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 new timber-framed external walls and columns 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 . . "

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 Act or the building code.

2 PROCEDURE

The building

2.1 The building work consists of a 3-storey house, situated on a level site in a medium wind zone in terms of NZS 3604: 1999 "Timber framed buildings". The external walls of the house are of conventional light timber frame construction built on concrete block foundation walls. The new timber-framed walls, apart from some of the lower sections of the ground floor walls that have a schist veneer, are sheathed with monolithic cladding. The house is generally of a reasonably simple shape, but with some complex aspects, and with the pitched roofs set at varying levels, the top one of which is curved. The roofs have hip and wall to roof junctions. There are 160mm to 180mm eaves projections, and the first floor is cantilevered over the ground floor at one elevation and projects as verandas over the garage and entrance areas. These latter projections are supported on circular monolithic clad columns.

2.2 A balcony is constructed over a habitable space at the first floor level. Two further balconies are constructed at the second floor level. One of these is situated over the first floor balcony and the other is set into a roofline over a habitable space. All the balconies have timber-framed balustrades and the two upper balconies have low-pitched roofs with curved perimeters over them. I note that an additional first floor balcony to the northeast elevation shown on the consent plans has been replaced with an infilled section of the house.

2.3 The specification calls for the wall framing to be H1 treated, but did not indicate the type of timber treatment to be used. I have not received any evidence as to the timber treatment, if any that has been applied to the external wall framing.

2.4 The new timber-framed external walls and columns of the house that are the subject of this determination are clad with a stucco system that is described as monolithic cladding. In this instance it incorporates 40mm thick polystyrene sheets fixed through the building wrap directly to the framing timbers, and finished with an "Insulclad" textured plaster finish. At the southern and part of the eastern elevations, the ground floor walls have a 1000mm high alpine schist veneer below the cladding. The veneer has a 35 mm wide cavity and is backed with Hardibacker sheets. The top

of the veneer is finished with a stone coping, and the monolithic cladding is finished with a base flashing over this.

2.5 Plaster Systems Ltd issued a "Material Component Guarantee" dated 17 July 2001, for a period of 15 years, and a "Workmanship Guarantee" dated 17 July 2001, for a period of 5 years.

Sequence of events

2.6 The territorial authority issued a building consent on 7 June 2000 and an amended building consent relating to fire ratings on 19 July 2001. There were no specific requirements relating to the cladding on the consent.

2.7 The territorial authority carried out various inspections during the construction of the house and these were all passed up to July 2001. The territorial authority carried out a final inspection on 31 December 2003, and noted on a "Final Check List": "exterior cladding to have cavity and control joints to be confirmed". A full further recheck was undertaken on 16 January 2004, and the territorial authority noted on a "Final Check List": "fail on non-cavity system".

2.8 The territorial authority wrote to the owner on 28 January 2004, noting that, as the cladding was monolithic installed without a cavity, further investigation was required.

2.9 Following a further inspection on 17 May 2004, the territorial authority wrote to the owner on 26 May 2004, regretting 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 26 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; and
4. Ventilated cavity system.

The owner was also 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 that all issues relating to the above are resolved…

2.10 The owner applied for a determination on 18 June 2004. However, the processing of the determination was delayed at the request of the owner until 24 December 2004.

3 THE SUBMISSIONS

3.1 The owner forwarded copies of:

- The plans and specifications;
- The consent documentation;
- The territorial authority's inspection records;
- The correspondence with the territorial authority;
- The Material Component Guarantee and the "Workmanship Guarantee";
- Some of the "Insulclad" technical information; and
- A report from the architect addressed to the Authority dated 10 January 2004, which queried the territorial authority's interpretation that the house is high risk using the new E2 matrix. The architect assessed all elevations of the house to be a low risk. The architect also noted that the territorial authority was in error when it stated that the cladding backing was fibre-cement. In a covering letter to the report, the architect confirmed that the construction of the house was to a high standard, the exterior cladding performed well, and the timber framing is "bone dry". Some construction details and photographs were also attached to the architect's report.

3.2 The territorial authority forwarded a lengthy submission. The bulk of the submission was a general comment on monolithic cladding, although some of the material related to this particular house.

3.3 The submission also included a copy of the Notice to Rectify, and a set of photographs, illustrating some of the territorial authority's concerns.

3.4 The territorial authority felt that it must refuse to issue a code compliance certificate on the grounds that there was insufficient scientific evidence on the performance of these building elements.

3.5 In a covering letter to the Authority dated 26 July 2004, the territorial authority noted that the "Particulars of Contravention" set out in the Notice to Rectify were the areas that concerned the territorial authority in relation to the determination. The territorial authority also assessed the house as being very high risk using the Acceptable Solution E2 severity matrix.

3.6 The territorial authority also forwarded copies of:

- The plans;
- Some of the consent documentation;
- The Notice to Rectify; and

- The correspondence with the owner.

3.7 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 cladding is not 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 Authority 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 the house and make a report. The expert visited the property on 1 March 2005, and furnished a report that was dated 21 April 2005. The expert noted that the exterior finish to the cladding is good throughout, and the plastering and painting is of a good standard. The expert was of the opinion that control joints are not required for a building with the dimensions of this house, and the flashings to the external windows and doors were in accordance with the manufacturer's recommendations.

5.2 The expert also arranged for a section of the capping over the stonework veneer to be removed. Based on this investigation and the presence of a drained and ventilated cavity to the veneer, the expert was of the opinion that the junction of the base of the cladding and the capping is satisfactory.

5.3 The expert carried out a series of non-invasive moisture tests at selected positions on the interior of the external walls, and established an average reading of 12.5%. Two additional invasive tests at one location gave readings of 12% and 17%. Moisture

levels above 18% at the exterior of the external walls after cladding is in place generally indicate that external moisture is entering the cladding.

5.4 The expert also commented on the territorial authority's "Particulars of Contravention" listed in the Notice to Rectify. The expert noted that remedial work had been undertaken to rectify some of the issues raised by the territorial authority. In addition, the expert considered that the drainage outlets to the balconies were adequate, the balcony balustrades were constructed to the manufacturer's recommendations current at the time that they were installed, and the penetrations had now been adequately sealed or flashed. The expert also stated that the only area of cladding that lacked a drip edge was to the first floor bulkheads and these were reasonably protected by the spoutings above them.

5.5 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 the weathertightness characteristics, I find that the house:

- Has eaves or verge projections that provide only limited protection to the cladding areas below them. However, there are some first floor overhangs which provide adequate protection at their locations;
- Is in a medium wind zone;
- Is 3 storeys high;
- Is generally of a reasonably simple shape on plan, but with some complex aspects, and with roofs that have hip and wall to roof junctions;
- Has three balconies, one of which is constructed over a habitable space;
- Has windows and doors that are fully flashed;

- Has lower level roof spaces and a veneered lower cavity to some locations that assist in the ventilation of the external wall cavities above them; and

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

Weathertightness performance

6.3 I have carefully considered the principal points in the territorial authority's main submission (and outlined in paragraph 3.3).

6.4 The territorial authority's general submission effectively questions the technical basis of a number of the benchmarks for assessing the likely code compliant performance of timber-framed construction in New Zealand and proposes that an alternative (and more conservative) benchmark be used to assess likely building code compliance for monolithically-clad buildings within its jurisdiction. The Authority considered and commented on these issues in determination no 2004/41. In essence, the Authority determined that the performance of building elements as installed in a house should be based on code compliance benchmarks established in the new external moisture acceptable solution E2/AS1, together with observations of the current state of the building, and not on the higher performance levels suggested by the territorial authority. Accordingly, I have followed the Authority's approach in this determination.

6.5 I find that the cladding appears to have been installed according to good trade practice and to the manufacturer's instructions, with no areas of concern. It can therefore be considered to be effective in preventing the penetration of moisture.

6.6 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 external doors and windows are fully flashed; and

- The house has lower level roof spaces and a lower-level stone veneer with a cavity that assist in the ventilation of the external wall cavities above them.

6.7 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.

6.8 I also accept the comments that the expert made in relation to the "Particulars of Contravention" as described in paragraph 5.4.

6.9 I note that all elevations of the house demonstrate a high 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 that the monolithic cladding complies with clause E2 at this time. In addition, because the cladding is unlikely to allow the ingress of moisture in the future, the house also complies with the durability requirements of clause B2

7.2 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.

7.3 I emphasise that each determination is conducted on a case-by-case basis. 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.

8 THE DECISION

8.1 In accordance with section 20 of the Act, I determine that the house is weathertight now and the cladding complies with clauses B2 and E2**.** Accordingly, I reverse the territorial authority's decision to refuse to issue the code compliance certificate.

8.2 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 15 June 2005.

John Gardiner
Determinations Manager