Determination 2007/107

The code compliance of a 6-year-old house at 72 Tresillian Avenue, Atawhai, Nelson

1. The matter 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, Manager Determinations, Department of Building and Housing ("the Department"), for and on behalf of the Chief Executive of that Department. The applicant is the owner of the building, Mr I Maclean acting through an agent ("the applicant") and the other party is Nelson City Council ("the territorial authority"). It appears that the agent for the applicant also carried out some of the inspections of the property during its construction, on behalf of the territorial authority.

1.2 This determination arises from the decision of the territorial authority not to approve the cladding installed on a 6-year-old house because it was not satisfied that it complied with the Building Code[2] (First Schedule, Building Regulations 1992).

1.3 The matter to be determined is whether the cladding as installed to the walls of the building ("the cladding"), complies with clauses B2 and E2 (see sections 177 and

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

188 of the Act). By "the 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 ("the expert"), and the other evidence in this matter. I have evaluated this information using a framework that I describe more fully in paragraph 6.1.

1.5 In this determination, unless otherwise stated, references to sections are to sections of the Act and references to clauses are to clauses of the Building Code.

2. The building

2.1 The building work consists of a two-storey detached house situated on an excavated sloping site, which is in a high wind zone for the purposes of NZS 3604[3]. The house is relatively simple in plan and form but with some complex features. Construction is conventional light timber frame constructed on concrete or timber-framed floors. The pitched roofs have hip and valley junctions and 750mm eaves projections.

2.2 A large timber-framed close boarded balcony supported by timber posts and beams runs the full length of the front elevation of the house at the upper-floor level. The balcony has a steel balustrade. A similarly constructed landing with associated steps leads up to the lower-floor rear entrance.

2.3 The expert has confirmed that the external wall framing is Douglas fir.

2.4 According to the information provided by the applicant, the walls of the house are clad with a system that comprises a 25mm thick three-coat Tyrolean finished plaster system applied over "Galvcrimp" netting that is fixed to diagonal timber sarking. The sarking is directly fixed through a building wrap onto the timber framing. The plaster is finished with three coats of acrylic paint. The majority of the windows have plastered and painted projections formed around their perimeters.

2.5 The plaster applicator provided a "Producer Statement" for the plaster system that included the statement that the system was in accordance with the BRANZ *Good Practice Guide*, the Building Code, and the manufacturer's recommendations.

3. Sequence of events

3.1 The territorial authority issued a building consent, in February 2001, under the Building Act 1991.

3.2 The territorial authority carried out inspections during the course of construction up to 23 August 2001 but apparently did not undertake a pre-plastering inspection. The territorial authority carried out completion checks on 13 September 2004 and 22

[3] [3] New Zealand Standard NZS 3604:1999 Timber Framed Buildings

February 2005. The territorial authority has noted "spoke to owner re: cladding" at the time of the last completion check.

3.3 On 23 March 2007, the Department received an application for a determination.

4. The submissions

4.1 Neither party made a formal submission.

4.2 The applicant forwarded copies of:

- the plans and the stucco work specification
- some consent and inspection documentation
- the plaster applicator's producer statement
- a letter from the painter describing the paint system
- some material invoices.

4.3 Copies of the applicant's documentation were forwarded to the territorial authority.

4.4 The draft determination was sent to the parties for comment on 19 July 2007. Both parties accepted the draft without comment.

5. The expert's report

5.1 As mentioned in paragraph 1.4, I engaged an independent expert, who is a member of the New Zealand Institute of Building Surveyors, to provide an assessment of the condition of those building elements subject to this determination.

5.2 The expert inspected the cladding of the house on 21 June 2007 and furnished a report that was completed on 26 June 2007. The expert noted that the stucco is very dense and is in excellent condition. Also, the paint finish is in a satisfactory condition. The expert removed a section of cladding at one window sill/jamb junction and I am prepared to accept that the details exposed at this situation apply to other similar locations throughout the building. The expert noted that there are no metal jamb or sill flashings installed to the external joinery units but heavyweight tar-based paper is finished folded into these locations. Given the age of the stucco it was expected that all shrinkage has already taken place.

5.3 The expert took non-invasive moisture readings internally around the house and all readings were within an acceptable range. Subsequently, a number of invasive moisture readings were taken with similar results.

5.4 Commenting specifically on the cladding, the expert noted that:

- there is limited hairline cracking visible in the cladding where it adjoins the external joinery unit jamb/sill junctions
- there is a gap between the paving slot drain and the base of the cladding
- the sealant has failed where the entry stair stringer abuts the cladding
- no saddle flashing is installed where the balcony boundary joist penetrates the cladding
- there is an area of unpainted stucco where the balcony balustrade rail abuts the cladding
- some penetrations through the cladding are inadequately sealed.

5.5 The expert also noted other non-compliant elements as follows:

- The ground has been built up over the retaining wall tanking.
- The aerial stay has not been sealed at the roof fixing.

5.6 Copies of the expert's report were provided to each of the parties on 3 July 2007.

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, 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 are conservatively written to 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 one or more other provisions 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[4] (for example, Determination 2004/1) 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. 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 the house:

- is built in a high wind zone
- is two-storey
- is relatively simple in plan and form but with some complex features
- has 750mm wide eaves projections
- has one upper-level external balcony and one lower-level landing with stairs
- has external wall framing that is not treated to a level that provides resistance to the onset of decay if the framing absorbs and retains moisture.

6.2.2 The house has been evaluated using the E2/AS1 risk matrix. The risk matrix allows the summing of a range of design and location factors applying to a specific building design to provide a risk rating that can range can range from 'low' to 'very high'. The risk rating is applied to determine how claddings can be used on a building in order to comply with E2/AS1. A higher risk rating will require more rigorous weatherproof detailing; for example, a higher risk rating is likely to require a particular type of cladding to be installed over a drained cavity

6.2.3 When evaluated using the E2/AS1 risk matrix, all elevations of the house demonstrate a low weathertightness risk. For this type of cladding, E2/AS1 requires a ventilated cavity irrespective of the risk level.

6.3 Weathertightness performance

6.3.1 Generally the cladding appears to have been installed in accordance with good trade practice. However, based on the expert's opinion, I accept that remedial work is necessary in respect of the following:

- The hairline cracking in the cladding where it adjoins the external joinery unit jamb/sill junctions
- The gap between the paving slot drain and the base of the cladding

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

- The failed sealant where the entry stair stringer abuts the cladding
- The lack of a saddle flashing where the balcony boundary joist penetrates the cladding
- The area of unpainted stucco where the balcony balustrade rail abuts the cladding
- The inadequately sealed penetrations through the cladding
- Any other building elements associated with the above that are consequentially discovered to be in need of rectification

6.3.2 Remedial work is also required with regard to the following non-compliant elements:

- The built-up ground over the retaining wall tanking
- The unsealed aerial stay roof fixing

6.3.3 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:

- Apart from the noted exceptions, the cladding is installed to reasonable trade practice.
- The house has 750mm wide eaves projections that provide excellent protection to the cladding below it.

6.3.4 I consider that these factors help compensate for the lack of a drained cavity and can assist the building to comply with the weathertightness and durability provisions of the Building Code.

7 Discussion

7.1 I consider that the expert's report establishes there is no evidence of external moisture entering the building, and accordingly, that its cladding does comply with clause E2 at this time.

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 on the 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 Because the faults 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

will result in the building remaining weathertight and in compliance with clauses B2 and E2.

7.4 Rectification of the items listed in paragraph 6.3.2 is also required in order to make the building code compliant.

7.5 I am prepared to accept that the details of the construction at the external joinery unit jambs and sills are apparently satisfactory. Also, that the insertion of control joints is not required as the plaster has not cracked in any major way over the past 6 years.

7.6 I emphasize 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.

7.7 I decline to incorporate any waiver or modification of the Building Code in this determination.

7.8 Effective maintenance of claddings (in particular monolithic cladding) 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.

7.9 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.

7.10 As the external wall framing of the building is not treated to a level that will resist the onset of decay if it gets wet, periodic checking of its moisture content should also be carried out as part of normal maintenance.

7.11 I also note that the windows are not fitted with sill flashings but are currently performing adequately. The ongoing maintenance of the windows and their junction with the plaster cladding is of particular importance.

8 The Decision

8.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the cladding does not comply with clause B2 of the Building Code (refer paragraph 6.3.1). I also determine that the items listed in paragraph 6.3.2 are not code-

compliant. Accordingly, I confirm the territorial authority's decision that the cladding does not comply with the Building Code.

8.2 I note that the territorial authority has not issued a notice to fix. A notice to fix should be issued that requires the owners to bring the defects listed in paragraphs 6.3.1 and 6.3.2 into compliance with the Building Code, including any associated defects discovered during the course of that work. The notice to fix should not specify how compliance is to be achieved, that is a matter for the owner to propose and for the territorial authority to accept or reject.

8.3 I would suggest that the parties adopt the following process to meet the requirements of paragraph 8.2. Initially, the territorial authority should issue the notice to fix. 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.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 17 September 2007.

John Gardiner
Manager Determinations