

Determination 2006/45

Refusal of a code compliance certificate for a house with a monolithic cladding system at 42 Laval Heights, Nelson

1 The dispute to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004¹ (“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 applicants are the owners Mr and Mrs Mant (“the applicants”), and the other party is the Nelson City Council (“the territorial authority”).
- 1.2 The dispute for determination is whether the territorial authority’s decision to decline to issue a code compliance certificate for a 5-year-old house because it was not satisfied that the monolithic cladding complied with clauses B2 “Durability” and E2 “External Moisture” of the Building Code² (First Schedule, Building Regulations 1992) is correct.
- 1.3 The question to be determined, therefore, is whether I am satisfied on reasonable grounds that the monolithic wall cladding as installed to the majority of the timber-framed external walls 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, the flashings, the joints and the plaster and/or the coatings) as well as the way the components have been installed and work together. I note that the remaining areas of the external walls, which are lined with horizontal pre-painted corrugated steel sheeting, have not been referred to by the territorial authority as being an issue for this house. Accordingly consideration of them does not form part of this determination.

¹ The Building Act 2004 and the Building Code are 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

- 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. I have not considered any other aspects of the Act or the Building Code.

2 The building

- 2.1 The building is a detached single storey split-level house with an attached garage and large subdivided basement area. The house is situated on an excavated sloping site that is in a high wind zone in terms of NZS 3604³. The building is of a relatively simple shape on plan but with some complex features. The pitched roofs are set at two levels, have valley and wall-to-roof junctions, and 400mm to 500mm wide eaves projections. The exterior walls are of conventional light-timber frame construction built on concrete slabs or timber-framed floors partly supported on pole foundations, and are sheathed with monolithic cladding.
- 2.2 A large timber-framed deck with an access stair is constructed external to the house at the ground floor level at the north and east elevations. The deck is supported on timber-framed beams and columns and has a balustrade constructed with a timber frame and pre-painted corrugated metal sheeting.
- 2.3 The expert commissioned by the Department to report on the cladding is of the opinion that the timber wall framing for the house is likely to be untreated Douglas Fir, and the owner has confirmed this. I have not received any other written evidence as to what timber was used for the external wall framing or what treatment, if any, is applied to this framing.
- 2.4 Apart from some minor areas lined with corrugated metal sheeting, the timber-framed external walls 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 4.5mm “Hardibacker” sheets fixed through the building wrap directly to the framing timbers. The sheets are finished with approximately 23mm thick plaster reinforced with galvanised wire netting. The expert is of the opinion that the plaster does not comply with the requirements of NZS 4251, the Code of Practice for solid plastering. The plaster is finished with a paint system.

3 Sequence of events

- 3.1 The territorial authority issued a building consent in 27 August 2001. No conditions were applied to this building consent.

³ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

- 3.2 The territorial authority undertook various inspections during the construction of the house and passed the pre-lining and post-lining inspections. A final inspection of the house was carried out on 6 May 2005.
- 3.3 In a letter to the applicants dated 8 June 2005, the territorial authority noted that a final inspection of the property was carried out on 6 May 2005 and also listed items that required attention prior to the issue of a code compliance certificate. The list included the comment that it appeared that the territorial authority had not inspected the cladding prior to plastering. It also noted that the plaster was cracked in many locations and some of the plaster ran below the ground level.
- 3.4 The territorial authority wrote again to the applicants on 22 June 2005. The territorial authority noted that as it could not find any record of an inspection taking place prior to the first coat of plaster being applied, it could not, on reasonable grounds, issue a code compliance certificate. The applicants could (in the territorial authority's view) either apply for a certificate of acceptance or apply to the Department for a determination. In order for the applicants to obtain a certificate of acceptance, they needed to get a comprehensive report from an approved building consultant. However, if a certificate of acceptance was issued, the applicants would never obtain a code compliance certificate.
- 3.5 The applicants made an application for a determination that was received by the Department on 15 July 2005.

4 The submissions

- 4.1 Under the "matter of doubt or dispute" the applicants identified the plasterer who had carried out the work on the house. The plasterer had stated that an inspector from the territorial authority had visited the site and had inspected the work when the plasterer was on the site.
- 4.2 The applicants also forwarded copies of:
- the plans
 - the building consent documentation
 - some territorial authority inspection notes
 - the territorial authority's correspondence to the applicants.
- 4.3 The territorial authority wrote to the Department on 14 July 2005. The territorial authority noted that it had been able to find records for all inspections carried out on the house with the exception of the pre-plaster inspection. None of the territorial authority's inspectors could recall having carried out such an inspection. While the territorial authority had not had any concerns regarding the plasterer on previous projects, in this case, due to a lack of the required inspection, it was unable, on reasonable grounds, to establish that the work was code-compliant.

- 4.4 Copies of the submissions and other evidence were provided to each of the parties. Neither the applicants nor the territorial authority made any further submissions in response to the submissions of the other party.
- 4.5 The draft determination was sent to the parties for comment on 17 February 2006. The territorial authority accepted the draft.
- 4.6 The applicant accepted the draft but in a letter to the Department dated 19 March 2006, submitted photographs of the windows and commented on various aspects of the draft determination, including compliance of the plaster cladding, the windows and the sealing of the electrical meter-box. I have viewed the photographs and considered the applicant's comments, and have amended the draft as I consider appropriate.

5 The expert's report

- 5.1 The expert inspected the cladding of the building on 31 August 2005 and on 7 December 2005, and furnished a report that was completed on 30 January 2006. The expert noted that, apart from the items requiring remedial work, the workmanship is of an acceptable standard. However, the expert stated that there are pockets where sand impurities are evident which, over the passage of time, could cause degradation of the paint surface. The expert also expressed concerns regarding the sand quality, mixing, application and curing of the plaster. The expert removed sections of the plaster at the base of the cladding and also adjoining a window jamb and sill junction. I am prepared to accept that these examples apply to similar details throughout the house.
- 5.2 The expert took non-invasive moisture readings through the interior linings of the exterior walls and all readings were within the acceptable range. The expert took further invasive readings at the exterior of the walls and while two higher readings were recorded, the expert attributed these to the moisture-meter being affected by the mesh reinforcement in the plaster.
- 5.3 The expert made the following comments regarding the cladding:
- there are several locations where the cladding is cracked
 - no control joints are installed
 - the base of the plaster lacks the required casing bead
 - the base of the cladding is too close to the adjacent ground at the east and south elevations of the garage
 - the jamb and sill flashings to the exterior joinery units as shown on the plans are not installed
 - the electrical meter-box board lacks a head flashing

- no separation gap is installed where the deck adjoins the cladding and the plaster is hard down onto the decking.

- 5.4 The expert also noted that the corrugated metal cladding has acceptable flashings and air seals, complies with the relevant design and installation handbook, and is therefore satisfactorily installed.
- 5.5 Copies of the expert's report were provided to each of the parties.

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 Solution⁴, 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 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; and
- Usually when there is non-compliance with one provision of an Acceptable Solution, it may be necessary to add some other provision to compensate for that in order to obtain compliance 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 (refer to Determination 2004/1 et al) 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 can be less robust. In any event, there is a need for both the design of the cladding system and the quality of its installation to be carefully carried out.

⁴ An Acceptable Solution is a prescriptive design solution approved by the Department that provides one way, but not the only way, of complying with the Building Code. The Acceptable Solutions are available from the Department's website at www.dbh.govt.nz.

6.2 Weathertightness risk

6.2.1 In relation to the weathertightness characteristics, I find that the house:

- has 400mm to 500mm wide eaves projections plus the deck overhangs, all of which provide good protection to the cladding areas below them
- is in a high wind zone
- is a maximum of two storeys high
- is of a relatively simple shape on plan, but with some complex features
- has a large deck constructed external to the house
- has external wall framing that is unlikely to be treated to a level that is effective in helping resist decay if it absorbs and retains moisture.

6.2.2 When evaluated using the E2/AS1 risk matrix, these weathertight features show that two elevations of the building demonstrate a medium weathertightness risk rating and two elevations demonstrate a high rating. 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.

6.3 Weathertightness performance

6.3.1 Generally, the cladding appears to have been installed according to reasonable trade practice, but some junctions and edges are not well constructed. These areas are described in paragraph 5.3, and in the expert's report, as being:

- the cracking at several locations
- the possible lack of control joints
- the lack of a casing bead to the base of the plaster
- the base of the cladding being too close to the adjacent ground at the east and south elevations of the garage
- the lack of jamb and sill flashings to the exterior joinery units
- the lack of a head flashing to the electrical meter-box
- the lack of a separation gap where the deck adjoins the cladding and the plaster being hard down onto the decking.

6.3.2 I note that the owner maintains that control joints have been provided. I consider that

the existence of control joints, in accordance with NZS 4251, will need to be established to the satisfaction of the territorial authority.

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 house has 400mm to 500mm eaves and additional deck projections that provide good protection to the cladding areas below them.

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 also the concerns that the expert has raised regarding the quality of the plaster and its application (see paragraph 5.1).

7 Conclusion

7.1 I consider that the expert's report establishes there is no evidence of external moisture entering the house, and accordingly, that the monolithic 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 house 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 Subject to further investigations that may identify other faults, I consider that, because the faults identified with the cladding system occur in discrete areas, I can conclude that satisfactory rectification of the items outlined in paragraph 6.3.1, together with any areas of defective plaster, is likely to result in the building being weathertight and in compliance with clauses B2 and E2.

7.4 Effective maintenance of claddings (in particular of 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.

7.5 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 shall 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.

7.4 As the external wall framing is unlikely to be treated to a level that will delay the onset of decay if it becomes wet, I recommend that periodic measurement of its moisture content be carried out to all areas of the external cladding.

7.5 It is emphasized 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.

7.7 Finally, I consider that the cladding will require on-going maintenance to ensure its continuing code compliance.

8 The decision

8.1 In accordance with section 188 of the Act I determine that the house is weathertight now and therefore the cladding complies with clause E2. However, as there are a number of items to be remedied to ensure it remains weathertight and thus meets the durability requirements of the Building Code, I find that the house does not comply with clause B2. Accordingly, I confirm the territorial authority's decision not to issue the code compliance certificate.

8.2 I also find that rectification of the items outlined in paragraphs 6.3.1 will consequently result in the house being weathertight and in compliance with clause B2. Work to correct these items may expose additional associated defects not yet apparent. All rectification work is to be completed to the approval of the territorial authority.

8.3 I note that the territorial authority has not issued a Notice to Rectify or a notice to fix. The territorial authority should now issue a notice to fix, and the owner is then obliged to bring the building 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.

8.4 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 to be 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.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing
on 24 May 2006.

John Gardiner
Determinations Manager