

Determination 2007/119

Determination regarding a code compliance certificate for a house with monolithic cladding at 714A Atawhai Crescent, Nelson



1. The matter 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, 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 C Leth (“the applicant”), and the other party is the Nelson City Council (“the territorial authority”).

1.2 This determination arises from the decision of the territorial authority to refuse to issue a code compliance certificate for 6-year-old alterations and additions to a house because it is not satisfied that the building work complies with clauses B2 and E2 of the Building Code² (First Schedule, Building Regulations 1992).

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.

1.3 The matter for determination is whether

1.3.1 Matter 1: The cladding

The claddings as installed (“the cladding”), complies with clause E2 “External Moisture” of the Building Code. 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.

1.3.2 Matter 2: The durability considerations

The elements that make up the building work comply with clause B2 “Durability” of the Building Code, taking into account the age of the building work.

1.4 In making my decision, I have considered the submissions of the parties, the report of the independent expert (“the expert”) commissioned by the Department to advise on this matter (see section 5), 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 alterations and additions to a small detached house situated on a steep west-sloping site, which is in a high wind zone for the purposes of NZS 3604³. The original single-storey house was built in about 1985, and the alterations included recladding the house and the addition of a basement level below part of the house. Construction is conventional light timber frame, with concrete slabs, concrete block foundations and retaining walls to the basement, timber-framed foundations to the single storey area, aluminium windows and monolithic wall cladding. The house shape is simple in plan and form; with a 16° pitch profiled metal gable roof that has eaves and verge projections of about 450mm.

2.2 An upper deck, formed from an original deck, sits partly above the basement. The deck extends along the west wall, and returns along the north elevation to provide access from the high ground level at the eastern end. The deck floor above the basement has a membrane floor, while the remaining areas retain the original spaced timber decking and open timber balustrades. A lower timber slat deck extends along the west wall of the basement.

2.3 A more recent addition has been added to the back of the house. This building work was constructed under a separate building consent, and does not form part of this determination.

2.4 The expert noted that the framing to the additions appeared to be Douglas Fir. I therefore consider that the recent wall framing of this house is likely to provide only

³ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

limited resistance to fungal decay. I have received no information on the treatment level of the timber framing to the original house and deck.

- 2.5 The cladding is a monolithic cladding system described as solid plaster over a solid backing. In this instance it consists of 4.5 mm “Hardibacker” sheets fixed through the building wrap directly to the framing timbers, and covered by a slip layer of building wrap, under metal-reinforced solid plaster and a flexible paint coating.

3. Background

- 3.1 The territorial authority issued a building consent (No. 991041) for the alterations and additions, which I have not seen, on 28 September 1999. Various inspections were carried out during construction including a pre-line inspection on 18 August 2000 and a pre-plaster inspection on 26 April 2001. No further building inspections were carried out until a code compliance certificate was requested. The territorial authority undertook a final inspection of the house on 22 March 2007.

- 3.2 In a letter to the applicant dated 29 May 2007, the territorial authority expressed its concerns about the condition of the stucco cladding and the possibility of ongoing damage if cracks and high moisture levels were not fully investigated and rectified. The territorial authority refused to issue a code compliance certificate, noting:

Six years have passed since the stucco inspection was undertaken. The final inspection indicated there is concern over the condition of the stucco and moisture readings to the exterior stucco at basement level. Nelson City Council cannot be satisfied on reasonable grounds that the work now meets all the requirements of the building code, especially B2 durability and E2 external moisture.

- 3.3 The territorial authority did not issue a Notice to Rectify under the Building Act 1991 (“the former Act”) or a notice to fix as required under section 164(2) of the Act.
- 3.4 The Department received an application for a determination on 18 June 2007 and additional information sought was received on 2 July 2007.

4. The submissions

- 4.1 The applicants forwarded copies of the:
- consent drawings of the original house
 - territorial authority’s inspection summary
 - letter dated 29 May 2007 from the territorial authority.
- 4.2 The territorial authority made no submission.
- 4.3 A copy of the submission and other evidence was provided to the territorial authority, which made no submission in response.
- 4.4 The draft determination was sent to the parties on 16 August 2007. The draft was issued for comment and for the parties to agree a date when the building elements

installed in the alterations and additions complied with Building Code Clause B2 Durability.

- 4.5 The territorial authority accepted the draft without comment and submitted that the building elements in the alterations and additions complied with the durability provisions of the building code on 1 June 2002. The applicants initially responded saying the date was at the discretion of the territorial authority. However, the applicants were advised of the date proposed by the territorial authority, which the applicants then confirmed as being acceptable.
- 4.6 I address the matter of which building elements were likely to comply with clause B2 on 1 June 2002 in paragraph 8.4.

5. The expert's report

- 5.1 As discussed in paragraph 1.4, I engaged an independent expert to provide an assessment of the condition of those building elements subject to the determination. The expert is a member of the New Zealand Institute of Building Surveyors.
- 5.2 The expert inspected the house on 16 July 2007, and furnished a report that was completed on 23 July 2007. The expert noted that the cladding was of "poor quality", with extensive cracking, poor paintwork and a reliance on sealants for weatherproofing.
- 5.3 The expert noted that the windows were face-fixed, with metal head flashings. The expert removed a small section of plaster at the jamb to sill junction of a west window and noted that no jamb or sill flashings were visible. At the sill, the building wrap was folded and returned in behind the sill flange, while the jamb used malthoid strips that extended from behind the slip layer to fold in behind the jamb flange.
- 5.4 The expert also removed a small section of cladding to inspect the stucco installation, and noted that the plaster had been applied in two coats over a slip layer and metal mesh. The expert observed various defects in the plaster, which are noted in paragraph 5.6.
- 5.5 The expert inspected the interior of the house and took non-invasive moisture readings, noting one elevated reading at the bottom of a basement door jamb. The expert took invasive moisture readings through the stucco at high risk locations, and the following elevated readings were noted:
- 27% at the bottom plate beside a door in the basement west wall,
 - 20% at the bottom of the stud at the northwest corner
 - 32% in the deck joists (measured from the inside where the joists extend into the interior structure)
 - 32% in the plywood substrate under the deck membrane (measured from the inside).
- 5.6 Commenting specifically on the cladding, the expert noted that:

- there are no vertical control joints, and some walls are above timber-framed foundations
- the plaster has numerous cracks, drummy areas and areas where the plaster is delaminating
- the slip layer is not level, which has resulted in the stucco varying in thicknesses with some areas being only 15mm thick
- the metal mesh is inadequately embedded within the first plaster coat, and is too close to the surface in some areas
- the bottom of the cladding lacks a drip edge, and the base moulding is missing on the north wall (where the slip layer is visible)
- there is generally insufficient clearance from the bottom of the cladding to paving and ground
- the projections of the window head flashings beyond the jambs are inadequate in some areas
- a decorative timber door “lintel” is embedded into the stucco on the upper west wall
- penetrations of pipes and fixings through the cladding are poorly sealed
- the paintwork is in poor condition
- the membrane deck is poorly weatherproofed, with the membrane delaminating at the south end and moisture penetrating into the plywood substrate
- the deck joists penetrate the exterior wall, with no saddle flashings, and moisture is penetrating into the interior of the structure.

5.7 A copy of the expert’s report was provided to each of the parties on 26 July 2007.

6. Evaluation for code compliance

6.1 Evaluation framework: exterior cladding

6.1.1 In evaluating the design of a building and its construction, it is useful to make some comparisons with the relevant Acceptable Solutions⁴, which will assist in determining whether the features of the building work 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.

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.

6.1.2 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 determinations⁵ (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 this house:

- is built in a high wind zone
- is two-storeys high in part
- is simple in plan and form
- has monolithic cladding that is fixed directly to the framing
- has eaves and verge projections of about 450mm above most walls
- has an upper level deck situated partly above an enclosed basement area
- has some external wall framing that will provide only limited 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. The resulting risk rating can range from 'low' to 'very high'. The risk rating is applied to determine what claddings can be used on a building in order to comply with E2/AS1 and thus clause E2 of the building code. A higher risk rating will necessitate more rigorous weatherproof detailing; for example, a high risk rating is likely to necessitate a particular type of cladding being installed over a drained cavity.

6.2.3 The weathertightness features outlined in paragraph 6.2.1 show that one elevation of this house demonstrates a high weathertightness risk rating, one elevation a moderate risk rating and two elevations a low risk rating.

6.2.4 Under the Building Act I am required to consider the E2 requirements applicable at the date of the building consent (viz 1999), and I note that at that time the relevant acceptable solution E2/AS1 permitted directly fixed stucco applied as per NZS 4251 over a drainage slip layer and without a cavity. In contrast, the current E2/AS1

⁵ Copies of all determinations issued by the Department can be obtained from the Department's website.

requires a cavity for all risk exposures for this system. However, I note that the installation of the cladding did not fully comply with the original E2/AS1 requirements, a fact which will influence my ability to accept it as a compliant system.

Matter 1: The cladding

7. Discussion

- 7.1 Taking into account the expert's report, I am satisfied that the current performance of the cladding installed on this house is inadequate because it has not been installed according to the requirements of NZS 4251, the Code of Practice for solid plastering, and to good trade practice. In particular, the cladding is at present allowing moisture penetration into the walls through defects in the cladding, which in turn may have led to framing timber decay in some locations.
- 7.2 The cladding demonstrates the key defects listed in paragraph 5.6, and I have also identified the presence of a range of known weathertightness risk factors in this house. The presence of the risk factors on their own is not necessarily a concern, but they have to be considered in combination with the significant faults identified in the cladding system. It is that combination of risk factors and faults that indicate that the structure does not have sufficient provisions that would compensate for e.g. the lack of a drained and ventilated cavity. Consequently, I am not satisfied that the cladding system as installed complies with either clause B2 or clause E2 of the Building Code.
- 7.3 I find that, because of the extent and complexity of the faults that have been identified in the cladding, I am unable to make a decision about how compliance might be achieved. I consider this can only be made after a more thorough investigation of the cladding, which will require careful analysis by an appropriately qualified expert. Once that analysis is completed, the chosen repair option (whether targeted repairs, re-cladding, or a combination of both) should be submitted to the territorial authority for its consideration and approval.

Matter 2: The durability considerations

8. Discussion

- 8.1 The territorial authority has concerns about the durability, and hence the compliance with the building code, of certain elements of the alterations and additions, taking into consideration the completion of the building work in or after 2001. (However, I have received no copies of inspection records to verify compliance with clause B2 around this date.)
- 8.2 The relevant provision of clause B2 of the Building Code requires that building elements must, with only normal maintenance, continue to satisfy the performance requirements of the Building Code for certain periods ("durability periods") "from the time of issue of the applicable code compliance certificate" (clause B2.3.1).

8.3 These durability periods are:

- 5 years if the building elements are easy to access and replace, and failure of those elements would be easily detected during the normal use of the building
- 15 years if building elements are moderately difficult to access or replace, or failure of those elements would go undetected during normal use of the building, but would be easily detected during normal maintenance
- the life of the building, being not less than 50 years, if the building elements provide structural stability to the building, or are difficult to access or replace, or failure of those elements would go undetected during both normal use and maintenance.

8.4 The territorial authority has submitted (refer paragraph 4.5) that the alterations and additions complied with clause B2 on 1 June 2002. Taking into account the nature of the defects identified in the wall cladding outlined in paragraph 5.6, I take the view that the wall cladding would not have complied with the durability provisions at that date. However, I accept that other building elements did comply as attested by the territorial authority.

8.5 I am therefore satisfied, that, apart from the wall cladding, the alterations and additions complied with clause B2 on 1 June 2002. This date has been agreed by the parties, refer paragraph 4.5.

8.6 In order to address these durability issues when they were raised in previous determinations, I sought and received clarification of general legal advice about waivers and modifications. That clarification, and the legal framework and procedures based on the clarification, is described in previous determinations (for example, Determination 2006/85). I have used that advice to evaluate the durability issues raised in this determination.

8.7 I continue to hold that view, and therefore conclude that:

- (a) the territorial authority has the power to grant an appropriate modification of clause B2 in respect of the building elements, apart from the exterior wall cladding, in the alterations and additions.
- (b) it is reasonable to grant such a modification, with appropriate notification, because in practical terms the building is no different from what it would have been if a code compliance certificate for the alterations and additions had been issued in 2002.

8.8 I strongly recommend that the territorial authority record this determination and any modifications resulting from it, on the property file and also on any LIM issued concerning this property.

9. The decision

9.1 In accordance with section 188 of the Act, I determine that the building does not comply with clauses B2 and E2 of the Building Code, and accordingly confirm the territorial authority's decision to refuse to issue a code compliance certificate.

9.2 I also determine that:

- (a) the building elements installed in the alterations and additions, apart from the wall cladding, complied with clause B2 on 1 June 2002.
- (b) the building consent is hereby modified as follows:

The building consent is subject to a modification to the Building Code to the effect that, clause B2.3.1 applies from 1 June 2002 instead of from the time of issue of the code compliance certificate for all building elements in the alterations and additions, provided that the modification does not apply to the wall cladding.

9.3 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 building work into compliance with the Building Code, without specifying the features that are required to be incorporated. 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.

9.4 I would suggest that the parties adopt the following process to meet the requirements of paragraph 9.3. Initially, the territorial authority should issue the new notice to fix. The owner should then produce a response to this in the form of a detailed 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 19 October 2007.

John Gardiner
Manager Determinations