



## Determination 2009/68

### Determination regarding the code compliance of a 10-year-old house with monolithic cladding at 14 Orpington Place, Stoke, Nelson



#### 1. The matters to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004<sup>1</sup> (“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 applicants are the owners, R and P Smith (“the applicants”), and the other party is the Nelson City Council (“the authority”), carrying out its duties as a territorial authority or building consent authority.
- 1.2 This determination arises from the decision of the authority to refuse to issue a code compliance certificate for a 10-year-old house because it was not satisfied that it complied with certain clauses of the Building Code<sup>2</sup> (First Schedule, Building Regulations 1992).

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<sup>1</sup> The Building Act 2004 is available from the Department’s website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

<sup>2</sup> The Building Code is available from the Department’s website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

1.3 The matters for determination, in terms of sections 177(a) and 188 of the Act<sup>3</sup>, are:

**1.3.1 Matter 1: The cladding**

Whether the cladding as installed on the house (“the cladding”) complies with Clause B2 “Durability” and Clause E2 “External Moisture” of the Building Code. By “the cladding as installed” I mean the components of the systems (such as the backing materials, the plaster, the flashings and the coatings), as well as the way the components have been installed and work together.

**1.3.2 Matter 2: The durability considerations**

Whether the building elements 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 expert commissioned by the Department to advise on this dispute (“the expert”), and other evidence in this matter. I have evaluated this information using a framework that I describe in paragraph 6.

## **2. The building work**

2.1 The building work consists of a house with a partial basement, which is situated on a gently sloping site in a low wind zone for the purposes of NZS 3604<sup>4</sup>. Construction is generally conventional light timber frame, with concrete foundations and floor slabs, concrete block retaining walls to the basement, monolithic and weatherboard claddings, aluminium windows and a pressed metal tile roof.

2.2 The house is fairly complex in plan and form, with the basement garage projecting beyond the upper walls at the east corner to form a lower level lean-to and gable. The 25° pitch pressed metal tile hipped and gabled roofs have eaves projections of about 350mm overall, with verge projections of about 200mm.

2.3 A ground level timber deck forms an infill of the western corner, while another deck forms a walkway to part of the southeast elevation. Both low-level decks have spaced timber slat floors and no balustrades.

2.4 The expert has noted that the timber framing is Douglas fir. Given the date of construction in 1998 and the lack of other evidence, I consider the external wall framing to be untreated.

## **2.5 The wall claddings**

2.5.1 The monolithic cladding is a system described as solid plaster over a rigid backing. In this instance the backing consists of 7.5mm plywood sheets fixed through the building wrap directly to the framing timbers, and covered by a slip layer of bitumen-based building wrap, and metal-reinforced 25mm thick solid plaster with a flexible paint coating.

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<sup>3</sup> 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.

<sup>4</sup> New Zealand Standard NZS 3604:1999 Timber Framed Buildings

- 2.5.2 The section of the northeast upper wall, above the garage lean-to roof, is clad in timber rusticated weatherboards. Timber facings are used at external corners, including over the junction with the stucco at the east corner.

### **3. Background**

- 3.1 The authority issued a building consent for the house (No. 980059) on 28 January 1998, under the Building Act 1991. I have not seen a copy of the building consent.
- 3.2 The authority carried out various inspections during construction, including pre-line inspections on 30 April 1998 and 5 May 1998. The inspection summary notes that the pre-plastering inspection was not carried out.
- 3.3 The authority carried out a final inspection on 3 September 1998, and the inspection summary notes seven items that required completion. A Notice to Rectify was issued on 7 September 1998, which listed the items to complete. These items appear to have been subsequently completed, and are not part of this determination.
- 3.4 According to the applicants, a re-inspection of the house was sought from the authority in 2003 and again in 2006. However, no inspection was carried out and the code compliance certificate remained outstanding.
- 3.5 In response to a request for a code compliance certificate, the authority wrote to the applicants on 23 January 2009, noting that the durability requirements of the Building Code commenced from the time of issue of the code compliance certificate. The authority also raised its concern regarding the lack of 'pre-plaster, backing, or stucco inspections requested or carried out'. The authority concluded that, as it was about 10 years since completion of the work, it would not issue a code compliance certificate due to the time elapsed, as it could not:

...be satisfied on reasonable grounds that the work now meets all the requirements of the building code, especially B2 durability and E2 external moisture.

The authority provided options of either engaging a weathertightness specialist to undertake a full review of the cladding or of applying for a determination.

- 3.6 The applicants, with their lawyer, subsequently met with the authority to discuss the above and, in a letter to the authority dated 17 February 2009, the lawyer confirmed the explanations provided by the authority and concluded:

Council did confirm that the only outstanding issue for Code Compliance would appear to be the stucco and pre-plaster inspection that must be carried out, and that once this is done and that [sic] any remedial work that may be required is completed, then Code Compliance will be issued.

- 3.7 The Department received an application for a determination on 1 May 2009.

### **4. The submissions**

- 4.1 In a statement accompanying the application, the applicants outlined the background to the situation, noting that their requests for re-inspections in 2003 and 2006 had

received no response from the authority. The applicants noted that the only outstanding issue appeared to be the stucco cladding, concluding:

In short, the Council has not followed up our request for a “final inspection” and their indifference to our requests in 2003 & 2006 has left us with no legal redress to the builder and our only knowledge of the missing inspections becoming apparent to us by the Council’s letter in 2009.

4.2 The applicants forwarded copies of:

- some of the drawings
- the authority’s computer-generated inspection summary
- the Notice to Rectify dated 7 September 1998
- the letter from the authority dated 23 January 2009
- the letter from the lawyer to the authority dated 17 February 2009.

4.3 The authority acknowledged the application and forwarded copies of:

- the computer-generated inspection summary
- the Notice to Rectify dated 7 September 1998
- the letter to the applicants dated 23 January 2009.

4.4 A draft determination was issued to the parties for comment on 2 July 2009. The draft was issued for comment and for the parties to agree a date when the house complied with Building Code Clause B2 Durability.

4.5 The authority and the applicants made several submissions in response to the draft determination and to the submissions made by each other.

4.6 In summary the authority’s submissions said:

- The appropriate date for the achievement of B2 Durability was 3 September 1998 when the final inspection was completed.
- The authority did not agree with the suggestion by the applicants that the appropriate date for the achievement of B2 Durability was June 2003 being the date when the as-built drainage plan was issued to the authority.
- The building work was completed in 1998. ‘Foundations, structural, pre-line and post-line inspections were all carried out during 1998 ...’ The authority disputed that this statement meant that all inspections had been carried out.
- The authority had no record of the applicants seeking re-inspections in 2003 and 2006.

4.7 In summary the applicants’ submissions said:

- The authority’s advice that ‘foundations, structural, pre-line and post-line inspections were all carried out during 1998 ...’ appeared to be at odds with the authority’s earlier position that some inspections were not completed.

- The applicants believed the appropriate date for the achievement of B2 Durability was June 2003 as a compromise in response to the actions of the authority.
- The applicants held the authority at least partly responsible for the position they were in given the time delay and that this had 'effectively cut [the applicants] off from any recourse to [the] builder'. The applicants also submitted the authority needs to be aware of 'the angst, stress and inconvenience this ... brings'. The applicants noted costs they had incurred.

4.8 I acknowledge the submissions made by the applicants. I note that although the authority noted all the inspections that been completed during 1998, these did not include the pre-plastering inspection, which was required by the authority but appears not to have been sought by the builder.

4.9 With respect to the date when the building work complied with Clause B2 Durability, I believe it is appropriate to use the date when the final inspection was completed (3 September 1998) as proposed by the authority. The date when the as-built drainage plan was issued to the authority, as proposed by the applicants, does not have any direct bearing on when the building work itself was completed.

## **5. The expert's report**

5.1 As mentioned 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. The expert inspected the house on 4 June 2009 and provided a report that was completed on 5 June 2009.

5.2 The expert noted that the house generally appeared to accord with the drawings. The construction appeared to be 'of good quality', with the cladding generally showing that 'there has been consideration given to sealing and weathering of the stucco cladding to prevent water entry at junctions and service penetrations'.

5.3 The expert noted that the stucco appeared to be in good condition, with no cracking evident. The expert removed several small sections of stucco and described the stucco as 'dense, not drummy'. He noted that the plaster thickness is 25mm to 30mm, with the mesh satisfactorily embedded into the scratch coat of the plaster.

### **5.4 The windows and doors**

5.4.1 For the stucco cladding, the expert noted that the aluminium joinery is face-fixed and appears well-sealed, with satisfactory metal head flashings. The expert removed a small section of cladding at the jamb to sill junction of a northeast dining room window, and noted the bitumen-based slip layer and embedment of mesh. I accept that the exposed junction is typical of similar locations elsewhere in the house.

5.4.2 Where doors have adjacent windows, the expert noted that the head flashing was continuous, with a metal flashing between the jambs of the units. By probing this detail, the expert was able to confirm that a foam seal had been installed between the flashing and the jamb flange.

5.4.3 The expert noted that the two northeast upper windows are face-fixed over the timber weatherboards, with satisfactory metal head flashings.

5.5 The expert noted that, although there is no evidence of control joints in the stucco, all shrinkage issues should have occurred during the 10 years since installation and there is no evidence of movement cracks.

5.6 The expert inspected the interior of the house, taking non-invasive moisture readings internally, and no evidence of moisture was observed. The expert took six invasive moisture readings through the cladding at areas considered at risk, and noted the following elevated readings:

**The bottom of the walls**

- 19% in the plywood backing and the bottom plate at the raised ground level on the northeast elevation, with corrosion in the base flashing
- 21% in the plywood backing, at the raised ground level on the southeast elevation (although the bottom plate was only 14%)

I note that the lower readings ranged from 9% to 14%. Moisture levels that vary significantly generally indicate that external moisture is entering the structure and further investigation is required.

5.7 Commenting specifically on the wall cladding, the expert noted that:

- the clearances from the bottom of the cladding to the ground are insufficient, with soil covering the bottom of the stucco in some areas
- the face-fixed windows in the stucco lack a drainage gap at the sill flanges
- the jambs to the windows in the weatherboard cladding lack rustic plugs, leaving gaps under the jamb flanges
- the facing at the east external corner junction between the stucco and weatherboards lacks rustic plugs, leaving gaps under the facing
- the internal corner junction between the upper weatherboard and stucco is not weatherproof, with no back-flashing or cover bead, and gaps are apparent
- the bottom of the apron flashing over the garage lacks a kick-out
- the deck boards butt against the stucco plaster, with no drainage gap.

5.8 A copy of the expert's report was provided to the parties on 19 June 2009.

## **Matter 1: The wall cladding**

### **6. Evaluation framework**

6.1 In evaluating the design of a building and its construction, it is useful to make some comparisons with the relevant Acceptable Solutions<sup>5</sup>, which will assist in

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<sup>5</sup> 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](http://www.dbh.govt.nz).

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.
- 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.

## 6.2 Weathertightness

6.2.1 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. Weathertightness risk factors have also been described in previous determinations<sup>6</sup> (for example, Determination 2004/1) relating to cladding and these factors are also used in the evaluation process.

6.2.2 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.

## 6.3 Weathertightness risk

6.3.1 This house has the following environmental and design features which influence its weathertightness risk profile:

### Increasing risk

- the house is fairly complex in plan and form
- most of the walls have monolithic cladding fixed directly to the framing
- the external wall framing is not treated to a level effective in resisting decay if it absorbs and retains moisture

### Decreasing risk

- the house is in a low wind zone
- the house is generally single-storey
- there are eaves and verge projections to shelter most of the walls.

6.3.2 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 level of risk can range from “low” to “very high”. The risk

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<sup>6</sup> Copies of all determinations issued by the Department can be obtained from the Department’s website.

level is applied to determine what cladding systems can be used on a building in order to comply with E2/AS1. Higher levels of risk will require more rigorous weatherproof detailing; for example, a high risk level is likely to require a particular type of cladding to be installed over a drained cavity.

- 6.3.3 When evaluated using the E2/AS1 risk matrix, the weathertightness features outlined in paragraph 6.3.1 show that two elevations demonstrate a moderate weathertightness risk rating and two a low risk rating. I note that, although a drained cavity is now required by E2/AS1 for solid plaster cladding at all risk levels, this was not a requirement at the time the house was constructed.

## **6.4 Weathertightness performance**

- 6.4.1 Generally the cladding appears to have been installed in accordance with good trade practice. However, taking account of the expert's report, I conclude that remedial work is necessary in respect of:

- the lack of clearances from the bottom of the cladding to the ground
- the lack of a drainage gap at the window sill flanges
- the lack of rustic plugs to the weatherboards, behind the window jamb flanges and behind the corner facing boards
- the lack of adequate weatherproofing at the internal corner junction between the weatherboards and the stucco
- the lack of a kickout to the bottom of the apron flashings
- the lack of a drainage gap between the deck timbers and the stucco.

- 6.4.2 With regard to control joints, I consider that the seriousness of the omission is offset to some extent by the fact that the stucco cladding appears to have been installed according to good trade practice and has been in place for more than 10 years with no signs of cracking or associated moisture entry. All drying shrinkage in the plaster and supporting framing would have occurred during the early part of the period since construction, and the cladding's future performance will be governed solely by response to environmental factors such as imposed temperature and moisture effects, wind, earthquake forces and seasonal foundation movements.

- 6.4.3 Notwithstanding the fact that the stucco cladding is fixed directly to the timber framing, thus limiting drainage and ventilation behind the cladding, I have noted the following compensating factors that assist the performance of some of the cladding in this particular case:

- Apart from the noted exceptions the cladding is installed to good trade practice.
- The cladding is well-maintained and in good condition, with no cracking.
- Moisture penetration is limited to one area, where defects have been identified.

- 6.4.4 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.



## **6.5 Weathertightness conclusion**

- 6.6 I consider the expert's report establishes that the current performance of the cladding is not adequate because it is allowing water penetration into the house in one location at present. Consequently, I am satisfied that the building does not comply with Clause E2 of the Building Code.
- 6.7 In addition, the building work 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 may allow the ingress of moisture in the future, the building work does not comply with the durability requirements of Clause B2.
- 6.8 Because the faults identified with the cladding occur in discrete areas, I am able to conclude that satisfactory rectification of the items outlined in paragraph 6.4.1 will result in the house being brought into compliance with Clauses B2 and E2.
- 6.9 It is emphasised that each determination is conducted on a case-by-case basis. Accordingly, the fact that particular cladding systems have been established as being code compliant in relation to a particular building does not necessarily mean that the same cladding systems will be code compliant in another situation.
- 6.10 Effective maintenance of claddings is important to ensure ongoing compliance with Clauses B2 and E2 of the Building Code and is the responsibility of the building owner. The Department has previously described these maintenance requirements, including examples where the external wall framing of the building may not be treated to a level that will resist the onset of decay if it gets wet (for example, Determination 2007/60).

## **Matter 2: The durability considerations**

### **7. Discussion**

- 7.1 There are concerns about the durability, and hence the compliance with the Building Code, of certain elements of the building taking into consideration the completion of the building work during 1998.
- 7.2 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).
- 7.3 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.

7.4 In this case the delay between the completion of most of the building work in 1998 and the applicant's request for a code compliance certificate has raised concerns that various elements of the building are now well through or beyond their required durability periods, and would consequently no longer comply with Clause B2 if a code compliance certificate were to be issued effective from today's date.

7.5 I am satisfied, that all the building elements complied with Clause B2 Durability on 3 September 1998. I acknowledge that this date has not been agreed between the parties; however the disagreement does not arise from a difference of opinion when the building work was completed.

7.6 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.

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

- (a) the authority has the power to grant an appropriate modification of Clause B2 in respect of all the building elements.
- (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 house had been issued in 1998.

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

## **8. What is to be done now?**

8.1 A notice to fix should be issued that requires the owners to bring the cladding into compliance with the Building Code, identifying the items listed in paragraph 6.4.1 and referring to any further defects that might be discovered in the course of investigation and rectification, but not specifying how those defects are to be fixed. It is not for the notice to fix to stipulate directly how the defects are to be remedied and the house brought to compliance with the Building Code. That is a matter for the owner to propose and for the authority to accept or reject.

8.2 I would suggest that the parties adopt the following process to meet the requirements of paragraph 8.1. Initially, the authority should issue the notice to fix. The owner should then produce a response to this in the form of a detailed proposal, based on further investigation as necessary (including investigation of the original framing timbers), and 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.

8.3 The Notice to Rectify issued in 1998 (see paragraph 3.3) listed seven items. It appears that this work has since been completed, and I leave it to the authority to confirm that the items have been rectified to its satisfaction.

8.4 Once the matters set out in paragraph 6.4.1 have been rectified to its satisfaction, the authority may issue a code compliance certificate in respect of the building consent as amended.

## 9. The decision

9.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the cladding does not comply with Clauses E2 and B2 of the Building Code, and accordingly confirm the authority's decision to refuse to issue a code compliance certificate.

9.2 I also determine that:

- (a) all the building elements installed in the house, apart from the items that are to be rectified as described in this determination, complied with Clause B2 on 3 September 1998.
- (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 3 September 1998 instead of from the time of issue of the code compliance certificate for all the building elements, except the items to be rectified as set out in paragraph 6.4.1 of Determination 2009/68.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 26 August 2009.

John Gardiner  
**Manager Determinations**