



Determination 2009/92

The issue of a notice to fix for a 15-year-old house at 61 Eders Road, Woodend, Waimakariri



1. The matters 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 applicants are the owners Mr and Mrs Gauld (“the applicants”), and the other party is the Waimakariri District Council (“the authority”), carrying out its duties as a territorial authority or building consent authority.
- 1.2 This determination arises from the decisions of the authority to refuse to issue a code compliance certificate and to issue a notice to fix for a 15-year-old house because it was not satisfied that it complied with certain clauses of the Building Code (First Schedule, Building Regulations 1992).
- 1.3 Accordingly, I consider that the matters for determination, in terms of sections 177(b)(i), 177(b)(iii) and 188 of the Act², are whether the decisions of authority to issue a notice to fix and to refuse to issue the code compliance certificate were correct. In order to determine this I must consider whether the external cladding to the house (“the cladding”) complies with Clause B2 Durability and Clause E2 External Moisture of the Building Code. In this context the cladding includes the

¹ The Building Act, Building Code, Compliance documents, past determinations and guidance documents issued by the Department are all available at www.dbh.govt.nz or by contacting the Department on 0800 242 243

² 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.

components of the system (such as the backing sheets, the flashings and the coatings), as well as the way the components have been installed and work together.

- 1.4 The notice to fix also stated that the applicants were required to apply to the authority for a modification in respect of the durability provisions of Clause B2 (see paragraph 3.8.4). I therefore leave this matter to the parties to resolve, once the cladding and all associated work has been made code compliant (refer also paragraph 7).
- 1.5 In making my decision, I have considered the submissions of the parties, the report of the property inspection company engaged by the applicants (“the inspection company”), the report of the 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.

2. The building work

- 2.1 The building work consists of a two-storey house on a flat site, that is in a medium wind zone for the purposes of NZS 3604³. Construction is generally conventional light timber frame, with concrete slabs and foundations, aluminium windows and monolithic wall cladding. The house is fairly complex in plan and form, with varying roof pitches, dormer windows and attached pergolas.
- 2.2 The main roof is a 35° pitch pressed metal tile gable roof with eaves and verges of about 100mm. The upper roof includes five dormer windows with 20° monopitched roofs, and ground floor roofs form lean-tos against the upper walls. The roof to the garage is profiled metal that is monopitched at 5°.
- 2.3 The northeast and northwest corners of the ground floor lean-to sections are infilled with timber pergolas. Conservatory glazing is included in the roof section between the pergolas. A glazed canopy extends above the south entry.
- 2.4 The exterior cladding is a form of EIFS⁴ consisting of 40mm expanded polystyrene backing sheets fixed directly to the framing over the building wrap, and finished with a mesh-reinforced textured coating system. The cladding system was subject to BRANZ Appraisal Certificate 193 (1990)⁵, which required head and sill flashings to windows and doors. It appears that such flashings were not accessories to the EIFS system at the time of the consent. The cladding applicator’s ‘Construction Statement’ notes that the cladding is installed in accordance with the appraisal certificate.
- 2.5 The expert forwarded a sample of timber framing to a testing laboratory for analysis, and the biodeterioration consultant’s analysis confirmed the sample as boron treated (probably to H1 level). Based on this evidence and the date of construction in 1993, I accept that the framing is treated to provide some resistance to timber decay.

³ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

⁴ External Insulation and Finish System

⁵ The appraisal certificate has since been withdrawn

3. Background

- 3.1 The applicants purchased the property in January 1993 and the authority issued a building consent (No. 93/0014) in February 1993, under the Building Act 1991. I have not seen a record of the consent. I note that the electrical certificate of compliance is dated 8 September 1993, so it appears that construction was completed during 1993 (although I have seen no copies of any inspection records).
- 3.2 A final inspection was not carried out until 2002, at which time a building inspection company was undertaking some building control functions on behalf of the authority (“the authority’s contractor”). The authority’s contractor carried out a final inspection on 13 November 2002, and the inspection record notes several items related to hot water supply and added ‘otherwise constructed according to standards in place at time of construction’.
- 3.3 According to the applicants, the authority wrote to them on 6 October 2004, explaining that changes related to the 2004 Act meant that a code compliance certificate for the house should be applied for before April 2005.
- 3.4 The authority’s contractor re-inspected the house on 10 March 2005, and the inspection record noted that no re-inspection was required. The applicants were left with a copy of that record. However, an extra note was subsequently added to the record, stating ‘inspection of exterior cladding required [before] CCC issued 11/3/05’.
- 3.5 Without the knowledge of the applicants the authority’s contractor carried out a ‘cladding final’ inspection on 22 March 2005. A copy of the inspection record was ‘left on site’, which recorded a number cladding features and defects. According to the applicants, they did not receive a copy of that inspection record. Under the impression that no further inspections were required, the applicants assumed that a code compliance certificate had been issued until they obtained copies of the property records in 2009.

3.6 The inspection company’s report

- 3.6.1 The applicants engaged an inspection company to inspect and report on the weathertightness of the cladding. The inspection company inspected the house on 20 April 2009, and provided an undated “inspection report”. The report described the background and construction of the house and identified various risk factors.
- 3.6.2 Invasive moisture testing recorded nine elevated readings in the bottom plate and one beneath a window. The report recommended remedial work to the cladding clearances, the unflushed windows, the garage door, the pergola timbers and the guttering. The inspection company also noted that the condition of the underlying timber framing could not be confirmed.
- 3.7 In a letter to the authority dated 5 May 2009, the applicants’ solicitor set out the background to the situation and noted that the applicants had been ‘under the erroneous belief for a number of years’ that all matters were resolved. The solicitor also noted that the authority had not issued a Notice to Rectify as required under

section 43(6) of the Building Act 1991, and attached an 'Advice of Completion of Building Work' which requested a code compliance certificate.

3.8 The notice to fix

3.8.1 The authority passed the above letter to the authority's contractor, which responded in a letter to the solicitor dated 29 May 2009. The authority's contractor explained its function as an agent of the authority, and noted that a further inspection of the cladding had been carried out at the authority's request. The authority's contractor listed 18 cladding defects, and explained that the weathertightness defects together with the type of cladding used meant that 'it would be remiss to issue a CCC' and stated that the authority would issue a notice to fix.

3.8.2 The authority subsequently wrote to the applicants on 8 June 2009, attaching a notice to fix and stating that:

An inspection of the exterior of the dwelling carried out as part of determining if a code compliance certificate can be issued has discovered cracking and other damage to the exterior protective coating. With a monolithic cladding the exclusion of exterior moisture is reliant on a thin water resistant surface coating. If this surface coating is cracked or damaged a pathway exists for moisture to enter the structure. Building work does not comply with the building code if it is not protected from exterior moisture.

3.8.3 The attached notice to fix stated the house did not comply with Clause E2 of the Building Code and had not been adequately maintained to prevent moisture penetration. The notice stated that, to remedy this, the applicants must:

- Rectify defective areas of the exterior cladding.
- Provide evidence that the person who applied the exterior coating is an approved applicator (approved by the manufacturer of the coating product used).
- Supply a construction review producer statement from the applicator of the exterior coating confirming that the coating has been installed in accordance with the manufacturer's requirements.
- Supply a product manufacturers warranty for the exterior coating.
- Supply an expert's report that establishes that there is no evidence of moisture entering the structure.
- Supply a copy of an inspection and maintenance regime for the exterior cladding.

3.8.4 The notice to fix also stated that 'you will be required to apply for an amendment to the consent for the durability of the exterior cladding to apply from the date of practical completion' (refer paragraph 1.4).

3.9 The Department received an application for a determination on 23 July 2009.

4. The submissions

4.1 In their submission dated 22 June 2009, the applicants outlined the background to the current situation, noting that until recently they had no reason to believe there were any problems. They considered that the authority's failure to communicate its

concerns had prevented the cladding issues from being addressed at the time. The applicants also noted that the cladding was now 16 years old and had 'required no major maintenance to date', with the 'slightly elevated moisture contents' in the framing being 'hardly enough to warrant a leaky home label'.

4.2 The applicants forwarded copies of:

- some of the inspection records
- the applicator's 'Construction Statement' for the cladding
- the inspection company's report on the cladding
- the correspondence with the authority and the authority's contractor
- the notice to fix dated 8 June 2009
- various other statements and information.

4.3 The authority acknowledged the applicants' submission, but made no submission in response.

4.4 A draft determination was issued to the parties for comment on 9 September 2009. Both parties accepted the draft without comment.

5. The expert's report

5.1 As mentioned in paragraph 1.5, 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 21 July 2009 and provided a report on 21 August 2009.

5.2 The expert noted that there was no record of any specification for the building and only one drawing showing floor plans and elevations only, with no sections or construction details. The house appeared to accord with the consent drawing.

5.3 The expert noted that windows and doors were recessed by the thickness of the cladding, with no evidence of head flashings. The expert removed small sections of cladding at three jamb to sill junctions ("the cutouts"), and observed that no jamb or sill flashings had been installed, with weathertightness relying on the coating only.

5.4 Moisture levels and timber sample testing

5.4.1 The expert extracted a sample of timber from the cutout below the south laundry window and forwarded it to a biodeterioration laboratory for analysis of treatment and decay. The laboratory confirmed that the sample:

- was treated with boron to an equivalent of about H1
- had most of the boron leached out, with only traces remaining
- contained pockets of early active soft rot, with active bacteria present
- appeared to have been close to saturation point for some time.

- 5.4.2 The expert inspected the interior of the house and took non-invasive moisture readings internally around the house and no elevated moisture readings were noted. However, water marks were observed at the bottom of the timber jamb reveal to a full length window to the conservatory area and moisture penetration into that area was confirmed by the invasive testing described below.
- 5.4.3 The expert took invasive moisture readings through the cladding at areas considered at risk, and elevated readings were recorded as follows:
- 18% in the bottom plates beside the east garage door jambs
 - 25% and 32% at the cutouts below the jamb to sill junctions of the south garage window
 - more than 40% at the cutout below the jamb to sill junction of the south laundry window, with decay confirmed in the timber, and more than 40% in the bottom plate below
 - more than 40% in the bottom plate beside the west conservatory window
 - 21% beneath the jamb of the west living room window.

Moisture levels above 18% generally indicate that external moisture is entering the structure and further investigation is required.

- 5.5 Commenting specifically on the external envelope, the expert noted that:

The walls and windows

- most clearances below the bottom of the cladding are unacceptable, with the cladding contacting the ground or paving in some areas
- there are some cracks in the cladding, with some evidence of past repairs
- the recessed windows and doors lack head, jamb and sill flashings, with cracking, moisture penetration and decay apparent in some areas
- the pergola rafters penetrate the wall cladding, and are inadequately sealed
- some of the pergola timbers are decayed
- a vent pipe to an upper wall is embedded into the cladding and a gully trap is embedded beneath the cladding
- fixings and service pipe penetrations through the claddings are not sealed

The roof

- the bottom of the apron flashings lack kick-outs and the flashing is directing water behind the cladding, with gaps and exposed timber apparent
- the ends of the fascias are embedded into the cladding coating
- a barge flashing to the west gable end is jointed so that the lower part overlaps the upper part, which will allow water to penetrate behind the barge
- the dressed edges of the apron flashings are lifting away from the roof tiles, and downpipes from upper roofs discharge above the apron without spreaders
- the boot flashing to the fire flue does not underlap the upper roof tile.

5.6 In the expert's opinion, 'a full reclad of the exterior cladding will be likely to achieve compliance with Clauses E2 and B2'.

5.7 A copy of the expert's report was provided to the parties on 11 August 2009.

6. Evaluation framework for code compliance

6.1 In evaluating the design of a building and its construction, it is useful to make some comparisons with the relevant Acceptable Solutions⁶, 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 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 some other provision 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 determinations⁷ (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 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 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 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.

⁷ Copies of all determinations issued by the Department can be obtained from the Department's website.

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

Features that increase risk

- the house is two-storeys high
- the house is fairly complex in plan and form
- the walls have monolithic cladding fixed directly to the framing
- there are limited eaves and verge projections to shelter the walls

Features that decrease

- the house is in a medium wind zone
- the external wall framing is treated to a level that provides some resistance to decay if it absorbs and retains moisture.

6.3.3 When evaluated using the E2/AS1 risk matrix, these features show that all elevations of the house demonstrate a high weathertightness risk rating. While not a requirement when this house was constructed, a drained cavity is now required by E2/AS1 for EIFS cladding at moderate and high risk levels.

6.4 Weathertightness conclusion

6.4.1 I consider the expert's report establishes that the current performance of the EIFS cladding is not adequate because there is evidence of high levels of moisture penetration and decay in at least one area. In particular, the EIFS cladding demonstrates the key defects included in paragraph 5.5, which are likely to have contributed to the moisture penetration and decay evident within the external walls.

6.4.2 I conclude that the following areas require rectification or further investigation:

- the lack of clearances from the bottom of the cladding to the ground or paving
- the cracks in the cladding
- the lack of window and door flashings
- the penetrations through or embedding into the cladding, of pergolas, pipes and fixings
- the apron flashings, the fascias ends, the barge flashings and the boot flashing
- investigation into the extent of timber decay in the framing resulting from the high levels of moisture penetration into the framing, with decay identified in one area and timber damage likely to also be present in other areas.

6.4.3 The lack of window flashings, and inadequate weatherproofing of other junctions have contributed to a systemic failure and considerable work is required to make the cladding code compliant, including the removal of the EIFS as required and the replacement of any decayed timber. Further investigation is necessary, including the systematic survey of all risk locations, to determine the full extent of the timber damage and the repairs required.

6.4.4 I have identified the presence of a range of known weathertightness risk factors for 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 faults identified in the EIFS 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 the lack of a drained and ventilated cavity within the cladding system.

- 6.4.5 I consider that final decisions on whether code compliance can be achieved by either remediation or re-cladding, or a combination of both, can only be made after a more thorough investigation of the cladding. This will require a careful analysis by an appropriately qualified expert. Once that decision is made, the chosen remedial option should be submitted to the authority for its approval. I note here that the cladding is now past its required 15 year durability period.
- 6.4.6 I note that the Department has produced a guidance document on weathertightness remediation⁸. I consider that this guide will assist the owners in understanding the issues and processes involved in remediation work to the EIFS cladding in particular, and in exploring various options that may be available to them when considering the upcoming work required to the house.
- 6.4.7 I note that there appears to have been a lack of maintenance that is likely to have contributed to the current condition of the external envelope of this house. 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).
- 6.4.8 I am satisfied that the building does not comply with the Building Code, and in my opinion the authority made an appropriate decision to issue a notice to fix. However, I am of the view that the notice to fix does not fully address the defects in this house, so it should be modified accordingly (refer to paragraph 8.1).

7. Compliance with Clause B2 Durability

- 7.1 The authority has 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 1993.
- 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 In previous determinations (for example Determination 2006/85) I have taken the view that a modification of this requirement can be granted if I can be satisfied that the building complied with the durability requirements at a date earlier than the date of issue of the code compliance certificate, that is agreed to by the parties and that, if there are matters that are required to be fixed, they are discrete in nature.

⁸ External moisture – A guide to weathertightness remediation. This guide is available on the Department’s website, or in hard copy by phoning 0800 242 243

7.4 Because of the extent of the defects in the EIFS cladding, and the possible consequential impact on the building's timber framing and therefore its structure, I am not satisfied that there is sufficient information on which to make a decision about this matter at this time.

7.5 I also note that the notice to fix stated that the applicants are required to apply to the authority for a modification in respect of the durability provisions, and I therefore leave this matter to the parties to resolve once the cladding and all associated work has been made code compliant.

8. What is to be done now?

8.1 Although I am satisfied that the authority made an appropriate decision to issue a notice to fix, I consider that the notice to fix does not fully address the defects in this house and it should be modified and reissued to the owner to take account the findings of this determination, identifying the items listed in paragraphs 6.4.2, 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.

8.2 I suggest that the parties adopt the following process to meet the requirements of paragraph 8.1. Initially, the authority should issue the modified 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 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.

9. The decision

9.1 In accordance with section 188 of the Building Act 2004, I hereby determine that:

- the external cladding does not comply with Building Code Clauses B2 and E2,
- accordingly I confirm the authority's decision to refuse to issue a code compliance certificate, and
- the authority's decision to issue the notice to fix is confirmed, however the authority is to modify the notice to fix to take into account the findings of this determination.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 23 October 2009.

John Gardiner
Manager Determinations