Department of Building and Housing
Te Tari Kaupapa Whare

Determination 2011/040

Refusal to issue a code compliance certificate for a 9-year-old house with monolithic cladding at 27 Tuscany Place, Ohauiti, Tauranga

1. The matters to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004[1] ("the Act") made under due authorisation by me, John Gardiner, Manager Determinations, Department of Building and Housing ("the Department"), for and on behalf of the Chief Executive of that Department. The applicants are the owners, C Radford and M Roberts ("the applicants"), and the other party is the Tauranga 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 9-year-old house, because it is not satisfied that the building work complies with certain clauses[2] of the Building Code (First Schedule, Building Regulations 1992). The authority's concerns about the compliance of the building work relate to its age and to the weathertightness of the cladding.

[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.

1.3 The matter to be determined[3] is therefore whether the authority was correct to refuse to issue a code compliance certificate. In deciding this, I must consider:

1.3.1 Matter 1: The external envelope

Whether the external building envelope of the house complies with Clause B2 Durability and Clause E2 External Moisture of the Building Code. The building envelope includes the components of the systems (such as the monolithic cladding, the windows, the deck, the roof claddings and the flashings), as well as the way the components have been installed and work together. (I consider this in paragraph 6.)

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 house. (I consider this in paragraph 7.)

1.4 I note that a building certifier inspected the construction of this house on the authority's behalf. The company ceased operating as a building certifier in 2005, but continued operating under a different name as the authority's agent to provide inspection services for the authority. In this determination, both entities are therefore referred to as "the authority's contractor".

1.5 In making my decision, I have considered the applicants' submission, the report of the expert commissioned by the Department to advise on this dispute ("the expert"), and other evidence in this matter.

2. The building work

2.1 The building work consists of a detached house situated on a gently sloping site in a medium wind zone for the purposes of NZS 3604[4]. The two-storey house is complex in plan and form and is assessed as having a high weathertightness risk.

2.2 Construction is generally conventional light timber frame, with concrete foundations and floor slab, monolithic wall claddings, aluminium windows and pressed metal tile roof claddings. The 35^{o} pitch gabled roof has parapets to gable end walls, with eaves projections of about 450mm, except for some recessed walls.

2.3 The expert noted no evidence of timber treatment, although he considered that the evidence from moisture testing indicated it to be untreated. Given the lack of evidence of treatment and the date of construction in 2001, I consider that the wall framing of this house is not treated.

2.4 The wall cladding

2.4.1 The monolithic wall cladding consists of 7.5mm thick fibre-cement sheets fixed through the building wrap to the framing, and finished with an applied textured coating system. A producer statement for the cladding system was apparently provided to the authority's contractor, but I have not seen a copy of this statement.

[3] Under sections 177(1)(b) and 177(2)(d) of the Act
[4] New Zealand Standard NZS 3604:1999 Timber Framed Buildings

2.4.2 The flush-finished fibre-cement extends to clad roof parapets, deck balustrades and a column, and a framed 'chimney' projecting from the east gable end wall. The textured coating extends over polystyrene windows sills and a planted band at the inter-storey level.

2.5 The deck

2.5.1 The house has a large enclosed deck, with monolithic-clad balustrades, opening off the first floor master bedroom. The deck is supported on a monolithic-clad column at the north corner and is partly situated above the kitchen. A small flat area, set within the roof slope above the garage, extends from the window sill level of a south-east bedroom.

2.5.2 The deck membrane appears to be a 1.5mm thick polyvinyl chloride sheet adhered to 15mm plywood. The membrane has a coloured stippled finish and the joints are heat-welded to provide a seamless surface. A producer statement for the membrane was apparently provided to the authority's contractor, but I have not seen a copy of this statement.

2.5.3 The membrane system has been appraised by BRANZ[5]; and the current appraisal states that the membrane will comply with Clauses E2 and B2, providing the system is 'designed, used, installed and maintained' according to the conditions described in the certificate. These conditions include:

- deck falls to be a minimum of 1:60 (1^{o}), with 'no ponding of water'
- membrane joints to be overlapped by 20mm minimum.

3. Background

3.1 The authority issued a building consent for the house (No. 4875) on 8 February 2001 under the Building Act 1991. I have not seen a copy of the building consent.

3.2 The inspections

3.2.1 The authority's contractor carried out various inspections during construction, including a pre-line building inspection on 11 May 2001, which noted 'exterior has been textured with no precladding inspection'. The last inspection recorded in 2001 was the drainage inspection on 5 July 2001, so it appears that the house was substantially completed by about August 2001.

3.2.2 The authority's contractor carried out final inspections on 10 February 2003; which identified required documentation and some minor outstanding items, none of which related to the fibre-cement cladding. Most of the documentation was subsequently provided and a re-inspection on 23 November 2004 confirmed that the only outstanding requirements were for an amended bracing plan and a higher deck barrier.

[5] BRANZ Appraisal Certificate No. 411 (2005), which replaced 411 (2000)

3.2.3 No further inspections were carried out until the applicants sought a code compliance certificate and the authority's contractor carried out another final inspection on 21 January 2008, which confirmed that the remaining requirements identified in the 2004 re-inspection had been completed.

3.3 The authority's refusal to issue a code compliance certificate

3.3.1 On completion of the final inspection the authority's contractor forwarded an 'inter office memorandum' dated 31 January 2008 to the authority, confirming that the remaining requirements were completed. However, the authority's contractor described the weathertightness risk features of the house and concluded that it could not:

> ...recommend that you issue a Code Compliance Certificate for:
>
> B2 – Durability: Given the time that has lapsed since the dwelling was built and the possible effects on building elements of external moisture.
>
> E2 – External Moisture: Given our inability to positively confirm that the building is meeting the performance criteria of this clause.

3.3.2 In a letter to the applicants dated 1 February 2008, the authority noted that it would issue a notice to fix as its contractor had advised that 'they believe the dwelling was constructed by methods that have now been found to be of a high risk construction.'

3.3.3 The attached notice to fix dated 1 February 2008 stated that the particulars of contravention or non-compliance were that the house 'may not comply with Clauses B2 and E2', quoting the reasons provided by the authority's contractor (see paragraph 3.3.1).

3.4 The Department received an application for a determination on 21 December 2010.

4. The submissions

4.1 In a letter to the Department dated 17 December 2010, the applicants explained that a code compliance certificate had been refused and the notice to fix issued 'after all the council requirements had met', noting that they believed the attached documents would:

> ...prove the building design complied with the building code in existence at the time of council consent being given in 2001 and could not possibly meet the requirements of the new building code brought in 2004.

4.2 The applicants provided copies of:

- the drawings
- the authority's contractor's inspection summary
- the authority's contractor's memo to the authority dated 31 January 2008
- the authority's letter dated 1 February 2008.

4.3 The authority acknowledged the application and made no submission. In making no submission, the authority has not provided any evidence to me as to why they believe the house is not code-compliant. I also note that the notice to fix provides no clear reasons for the conclusion that the house 'may not' comply with Clauses B2 and E2. I do not believe that this is acceptable. It is important that, should an owner be

declined a code compliance certificate or a certificate of acceptance, they be given clear reasons why. The owner(s) can either then act on those reasons or apply for a determination if they dispute them.

4.4 A draft determination was issued to the parties for comment on 4 March 2011.

4.5 Both parties accepted the draft without comment, with the applicants' response received on 28 April 2011.

5. The expert's report

5.1 As mentioned in paragraph 1.5, I engaged an independent expert to assist me. The expert is a member of the New Zealand Institute of Building Surveyors and inspected the house on 15 February 2011; providing a report dated 25 February 2011.

5.2 The expert considered that the cladding was 'well aligned' but parapet cappings had been retro-fitted some years after construction and various other flashings were missing. He also noted that some elevations had been recently repainted.

5.3 Windows and doors

5.3.1 The expert observed that windows and doors had metal head flashings and were face-fixed against the fibre-cement backing sheets prior to applying the coating system. The decorative polystyrene 'sill' is texture-coated and sealed against the sill flange.

5.3.2 The expert inserted a blade behind the window jamb flanges and noted that there was no sign of seals behind the flanges, with a small fillet of sealant applied at the edge of the frame.

5.4 Moisture levels

5.4.1 The expert inspected the interior of the house and took non-invasive moisture readings; noting no evidence of moisture penetration.

5.4.2 The expert took invasive moisture readings through the wall cladding into the framing at locations considered to be at particular risk of moisture penetration. The lowest readings were from 10% to 13%; indicating the likely equilibrium moisture content in the framing. Of the 21 readings, 13 (60%) were elevated as follows:

Roof parapets

- decay in the bottom plate at both ends of the south parapet wall to garage
- decay in the bottom plate at the north corner of the dining room
- 23% at the crack under the parapet end at the north corner of bedroom 2
- 21% in the bottom plate at the east corner of the family room

Windows

- decay in the bottom plate under the jamb to sill junction and under the north corner sill to the northeast family room corner window (also under a parapet)
- 22% under the jamb to sill junction of the southwest study window

- 17% under the jamb to sill junction of the southwest lounge window

The north east deck

- 27% to 55% in the top plate to the deck balustrade
- more than 80% in the bottom plate under the north balustrade to wall junction
- decay in the kitchen bottom plate (recessed part way beneath the deck floor).

Moisture levels above 18%, or which vary significantly, generally indicate that external moisture is entering the structure and further investigation is needed.

5.5 Taking account of the above moisture readings, the expert limited his further investigation of the cladding. However, commenting specifically on the external envelope of the house, the expert noted that:

General

- a full investigation is needed into the full extent of decay to the framing
- there are some cracks in the cladding, with attempts at sealant repairs (I note that recent repainting may also conceal some cracking)
- there is no evidence of vertical control joints in walls longer than 5.4m. (I also note that the expert did not investigate the inter-storey joints concealed by the decorative planted band)
- there are insufficient clearances below the cladding at the garage door
- the exposed meter box relies on sealant only for weatherproofing

Windows and doors

- the head flashings do not project sufficiently beyond the jamb flanges
- the windows are face-fixed against fibre-cement backing sheets, with no seals behind jamb flanges, no drainage gaps at the projecting sills and the coating applied after the window installation

Parapets

- the gutters butt against and are sealed to the ends of the parapet walls
- obvious decay in some areas below the parapets indicates the likelihood of high levels of moisture penetration for some 5 years prior to capping installation
- although the metal parapet cap flashings installed some 2 to 3 years ago appear satisfactory, there remains some elevated moisture levels below the ends

The deck

- the balustrades have flat textured tops, with moisture apparent in top plates
- the balustrade to wall junctions appear to have no saddle flashings, with high moisture levels in a ground floor bottom plate below the north junction
- I note the deck membrane has welded joints, in lieu of overlapped joints as required in the current BRANZ appraisal (see paragraph 2.5.3)
- I also note that the decayed bottom plate in a wall recessed beneath the deck floor may relate to a lack of weathertightness in the membrane above.

5.6 The expert noted that it was not possible to discover the full extent of defects without removing cladding and analysing timber samples. He therefore considered that a 'full building survey' is needed as his limited investigations indicated that:

> ...the problems identified are sufficiently widespread to cause serious concern. If these moisture levels are maintained or increased, without appropriate remedial work, there will be an increasing likelihood of wood decay and consequent premature deterioration of the framing timbers in effected locations.

5.7 A copy of the expert's report was provided to the parties on 28 February 2011.

Matter 1: The cladding

6. Weathertightness

6.1 The evaluation of building work for compliance with the Building Code and the risk factors considered in regards to weathertightness have been described in numerous previous determinations (for example, Determination 2004/1).

6.2 Weathertightness risk

6.2.1 The house has the following environmental and design features which influence its weathertightness risk profile:

Increasing risk

- the house is two-storeys-high
- there is a deck with clad balustrades, situated partly over enclosed areas
- there are complex roof and wall junctions, parapets and other features
- the cladding is fixed directly to the framing
- the external wall framing is not treated to a level that provides resistance to decay if it absorbs and retains moisture.

Decreasing risk

- the house is in a medium wind zone
- there are eaves to shelter some of the cladding.

6.2.2 When evaluated using the E2/AS1 risk matrix, these features show that the elevations of the house demonstrate a high weathertightness risk rating. I note that, if the details shown in the current E2/AS1 were adopted to show code compliance, the cladding would require a drained cavity. However, I also note that a drained cavity was not a requirement at the time of construction.

6.3 Weathertightness performance

6.3.1 It is clear from the expert's report that the external building envelope is unsatisfactory in terms of its weathertightness performance; resulting in moisture penetration and decay to the framing. Taking into account the expert's report, I conclude that the areas outlined in paragraph 5.5 require rectification, although I stress that a full investigation may reveal other areas that also require rectification.

6.3.2 Considerable work is required to make the external envelope weathertight and durable. Further investigation is necessary, including the systematic survey of all risk locations, to determine the causes and the full extent of defects, moisture penetration, timber damage and the repairs required.

6.4 Weathertightness conclusion

6.4.1 I consider the expert's report establishes that the current performance of the building envelope is not adequate because there is evidence of significant moisture penetration and decay in the timber framing. Consequently, I am satisfied that the house does not comply with Clause E2 of the Building Code.

6.5 In addition, 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 will continue to allow the ingress of moisture in the future, the building work does not comply with the durability requirements of Clause B2. Also, given the extent of non-compliance with Clause E2 and the extent of damage to the external framing, the building's ongoing compliance with Clause B1 must be considered following further investigation.

6.6 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 and deck, and the condition of the underlying timber framing. This will require a careful analysis by an appropriately qualified expert, and should include a full investigation of the extent, level and significance of the timber decay to the framing. Once that decision is made, the chosen remedial option should be submitted to the authority for its approval.

6.7 I note that the Department has produced a guidance document on weathertightness remediation[6]. I consider that this guide will assist the owners in understanding the issues and processes involved in remediation work to the cladding, and in exploring various options that may be available when considering the upcoming work required to the house.

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 house in 2001.

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

[6] 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

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.

7.4 Because of the extent of further investigation required into the timber framing and therefore the house's structure, and the potential impact of such an investigation on the external envelope, I am not satisfied that there is sufficient information on which to make a decision about this matter at this time.

8. What is to be done now?

8.1 A notice to fix should be issued that requires the owners to bring the house into compliance with the Building Code, including the defects identified in paragraph 5.5, but not specifying how those defects are to be fixed. It is not for the notice to fix to specify how the defects are to be remedied and the building brought to compliance with the Building Code. That is a matter for the owners to propose and for the authority to accept or reject.

8.2 In addition, the notice to fix should include the requirement for a full investigation into the extent and the causes of decay in the timber framing, referring also to the need for laboratory testing of framing samples to establish the full extent, levels and structural significance of decay to the framing.

8.3 I suggest that the parties adopt the following process to meet the requirements of paragraph 8.1. The applicants should produce a response to the notice to fix in the form of a detailed proposal, produced in conjunction with a competent and suitably qualified person, as to the investigation and rectification or otherwise of the specified matters. 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 building envelope does not comply with Building Code Clauses E2 and B2 and accordingly, I confirm the authority's decision to refuse to issue a code compliance certificate.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 2 May 2011.

John Gardiner
Manager Determinations