



Determination 2011/024

Refusal to issue a code compliance certificate for a 10-year-old house with monolithic cladding at 17 Jackson Place, Pukekohe



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 R and F Graham (“the applicants”), and the other party is the Auckland Council² (“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 the house complied with certain clauses³ 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 weathertightness.

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 After the application was made, and before the determination was completed, Franklin District Council was transitioned into the Auckland Council. The term “authority” is used for both.

³ 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 determined⁴ 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 claddings to the house (“the claddings”) comply with Clause B2 Durability and Clause E2 External Moisture of the Building Code. The claddings include the components of the systems (such as the monolithic wall cladding, the windows, the roof cladding and the flashings), as well as the way the components have been installed and work together. (I consider this matter in paragraph 6.)

1.3.2 Matter 2: The durability considerations

Whether the elements that make up the building work comply with Building Code Clause B2 Durability, taking into account the age of the house. (I consider this matter in paragraph 7.)

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 the other evidence in this matter.

2. The building work

2.1 The building work consists of a detached house with a basement garage, which is situated on a sloping site in a high wind zone⁵ for the purposes of NZS 3604⁶. Construction is generally conventional light timber frame, with a concrete slab and foundations, concrete block basement walls, monolithic wall cladding, aluminium windows and profiled metal roofing. The house has a moderate to high weathertightness risk (see paragraph 6.2).

2.2 The expert refers to the street frontage as the west elevation, and this determination uses that convention to identify elevations. The house is fairly simple in plan and form; with 27° pitch gabled roofs that have no eaves or verge projections, except for several areas where walls are recessed. A monolithic-clad ‘chimney’ structure projects through the roof on the north elevation and the roof is split-level at the eastern end; resulting in complex wall to roof junctions. A separate gable above the main entry includes a parapet and internal gutter at the junction with the main roof.

2.3 An enclosed deck cantilevers above the west garage door and is partly situated above the garage area. The deck has monolithic-clad balustrades and a membrane floor over a plywood substrate. An attached timber pergola extends over part of the deck and is supported on monolithic-clad columns. A ground level deck, with a spaced timber slat floor, fills the southeast corner between the family/dining wing and the bedroom wing.

2.4 The expert removed timber samples from a stud and four bottom plates and forwarded them to a testing laboratory for analysis. The biodeterioration consultant’s analysis confirmed that two samples from bottom plates were boron treated while the remaining samples were untreated. Given the date of construction

⁴ Under sections 177(1)(b) and 177(2)(d) of the Act

⁵ Based on the wind classification in the bracing calculations

⁶ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

of the house in 2000, I consider that, apart from some bottom plates, the wall framing is untreated.

2.5 The wall cladding

2.5.1 The cladding system is a form of monolithic cladding system known as EIFS⁷. In this instance, the cladding system consists of 90mm polystyrene backing sheets fixed directly to the framing over the building wrap and finished with a proprietary textured coating system.

2.5.2 The expert was unable to identify whether the cladding was a recognised proprietary EIFS system. However, I note that the drawings nominated the cladding as a specific proprietary system and the authority has used the same reference within the inspection records. That proprietary system includes purpose-made flashings to windows, edges and other junctions.

3. Background

3.1 The authority issued a building consent (No. 31548) on 24 November 1999 under the Building Act 1991, with construction taking place during 2000.

3.2 The authority carried out various inspections during construction, including pre-line inspections during June 2000. A cladding inspection on 26 June 2000 noted 'fixing not at the correct centres' (see paragraph 3.5.2). The last inspection recorded was of drainage on 16 August 2000.

3.3 The applicants have stated that the house was substantially completed in August 2000; although a partial final inspection was not carried out until 6 September 2005, with the inspection record identifying ten items to be attended to. The inspection record stated that:

Inspection of exterior cladding not part of this final as instructed by team leader.

Owner to apply to the DBH for a determination re exterior cladding system. Fixing of [the EIFS] was not approved on 26-6-00. Fixings not at the correct centres.

3.4 There appears to have been no further correspondence until the Department received an application, which was accepted for determination on 6 August 2010.

3.5 The authority's clarification

3.5.1 The Department sought further information from the authority regarding the particular matters to be determined. In particular, clarification was requested about the authority's concerns regarding the fixing of the cladding.

3.5.2 The authority responded in an email dated 3 September 2010, noting that the inspector who undertook the pre-coating inspection had advised that fixings to backing sheets were 'in excess of manufacturer's specifications', which was why the inspection was not approved. As the final coating system covered fixings, the cladding was therefore excluded from the final inspection in 2005.

⁷ Exterior Insulation and Finish System

3.5.3 The authority noted that the advice given in 2005 to seek a determination on ‘the ability of the cladding to comply with the Building Code’ was also because:

... the cladding was face-fixed and on untreated timber framing, construction methods for monolithic cladding systems had changed since installation and there was some doubt in 2005 about its compliance.

3.5.4 The authority concluded that its view:

...is that a failure to follow the cladding manufacturer’s specification is such a departure... ...that the Council would not entertain it at all as being satisfactory. And the changes in construction techniques to minimise the risk of failure (as many monolithic claddings are prone to do) reinforces the doubt Council has as to whether the cladding is compliant with the Building Code.

4. The submissions

4.1 The applicants forwarded copies of:

- the drawings and specification
- the authority’s inspection summary
- the inspection record of the final inspection on 6 September 2005.
- various other items of information.

4.2 The authority made no submission outside of its clarification referred to in paragraph 3.5.

4.3 A draft determination was issued to the parties for comment on 8 November 2010. The authority accepted the draft without comment in a response received by the Department on 22 November 2010.

4.4 The Department repeatedly sought a response from the applicants and a final request for submissions was made on 17 March 2011. The applicant’s accepted the draft in a response received on 23 March 2011 and noted that a ‘full assessment’ of the house was being conducted.

5. The expert’s report

5.1 As mentioned in paragraph 1.4, I engaged an independent expert to assist me. The expert is a member of the New Zealand Institute of Building Surveyors. The expert inspected the house on 24 September 2010, providing a report dated 18 October 2010. The expert noted that the house appeared to accord with the consent drawings.

5.2 General

5.2.1 The expert noted that the overall quality of the wall cladding appeared ‘reasonable’ except for the items identified below, with the paint finish well maintained and in ‘reasonable condition for its age’.

5.2.2 The expert also noted that there appeared to be no apparent problems resulting from the excess fixings of the polystyrene backing sheets (see paragraph 3.5.2). I note there would be no need for control joints in walls of these dimensions.

- 5.2.3 The aluminium joinery is recessed by about 90mm, with texture-coated polystyrene ‘sills’ beneath the windows. The expert has advised that he confirmed the presence of uPVC flashings. However, I note that a sample jamb to sill junction was not exposed, so the treatment of that flashing junction is unknown.

5.3 Decay analysis

- 5.3.1 The expert removed five timber samples and forwarded them to a biodeterioration consultant for analysis. The samples were taken from the following areas:

- bottom plate and stud below dining room south window (samples 1 and 1A)
- bottom plate below end of apron flashing above bedroom 2 (sample 2)
- bottom plate below north living room window (sample 3)
- bottom plate below north balustrade to wall junction (sample 4)

- 5.3.2 The biodeterioration consultant’s report, dated 30 September 2010, found that samples 1, 1A and 2 contained no timber treatment, and:

- sample 1 contained ‘advanced brown rot throughout’
- sample 1A contained ‘pockets of incipient to advanced brown rot’
- sample 2 contained ‘pockets of early soft rot and incipient to early brown rot’.

- 5.3.3 Samples 3 and 4 were boracic-treated. Although containing no established decay, these samples contained ‘prolific and recently active’ fungal growths and had come ‘close to conditions conducive to serious decay’. The report warned of possible significant decay in adjacent areas of untreated framing.

- 5.3.4 The report concluded that results suggested all of the samples ‘had been exposed to moisture conditions that are inconsistent with sound building practice and/or weathertight design, and appropriate remediation is needed to correct this.’

5.4 Moisture levels

- 5.4.1 The expert inspected the interior of the house, noting damage and deterioration of the carpet edge to bedroom 2. The expert carried out invasive moisture testing and took sample 2 from this area beneath the end of the apron flashing.

- 5.4.2 The expert carried out invasive moisture testing to 22 areas considered to be at high risk of moisture penetration, recording readings from 11% to 100% as follows:

Windows

- 15% but with advanced decay in the untreated stud and bottom plate under a dining room south window (samples 1 and 1A)
- 18% below jamb to sill junction of bedroom south window, with 17% in bottom plate below
- 16% and 23% in the bottom plate beneath a living room north window

Apron flashings and internal gutter

- 23% and early decay in the untreated bottom plate under end of apron flashing over bedroom 2 (sample 2)
- 16% in the bottom plate near to the apron flashing to the north chimney, with fungal growth in the treated timber indicating moisture penetration (sample 3)
- 100% in the beam beneath the internal gutter over the west entry, with 22% in the bottom plate of the adjacent wall

The deck

- 16% in bottom plate below the deck balustrade to north wall junction, with fungal growth in the treated timber indicating moisture penetration (sample 4).

I note that moisture levels that vary significantly generally indicate that external moisture is entering the structure and further investigation is required and that readings over 40% indicate that the timber is saturated and decay will be inevitable over time.

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

- vents installed in the gable end walls are unsealed

Windows

- there are cracks at the junctions of the EIFS reveals with the window flanges, allowing moisture to penetrate by capillary action
- the sealing of the underlying sill to jamb junctions is unknown, with moisture and decay apparent in framing below some windows
- there is no drainage gap under sill flanges to allow any moisture to drain to the outside

Roof junctions

- at roof to wall junctions, the ends of gutters and the parapet above the entry are embedded within the EIFS cladding
- the ends of the apron flashings lack kick-outs and moisture is penetrating behind the cladding, with moisture and decay apparent in bottom plates below
- the internal gutter above the entry is not weatherproof, with a flat top-fixed metal capping to the adjacent parapet, sealants only at junctions and no overflow – and considerable moisture is penetrating into the beam below
- the fascias and barge boards have been installed prior to the wall cladding, with no overlap and cracking at the junction

The decks

- the balustrade to the west deck has a flat EIFS top, with no capping or evidence of underlying membrane and there are cracks at the edges
- there are no saddle flashings at the junctions of the balustrades with the walls, and moisture is penetrating the balustrade framing
- the pergola rafters over the west deck penetrate the wall cladding, with no evidence of seals or flashings

- the tops of the monolithic-clad pergola columns are flat EIFS, with the pergola framing fixed through the top
- the south east deck butts against the EIFS, with no allowance for drainage.

5.6 A copy of the expert's report was provided to the parties on 19 October 2010.

Matter 1: The external envelope

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

Increasing risk

- the house is in a high wind zone.
- there is an enclosed upper deck, located above a garage area
- the walls have monolithic cladding fixed directly to the framing
- although fairly simple in plan and form, there are some complex junctions
- there are no eaves or verge projections to shelter the cladding
- 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 single-storey with a basement garage.

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

6.3 Weathertightness performance

6.3.1 It is clear from the expert's report that the EIFS cladding is unsatisfactory in terms of its weathertightness performance, which has resulted in moisture penetration and decay to some of the framing. Taking into account the expert's report, I conclude that the areas outlined in paragraph 5.5 require rectification.

6.3.2 Considerable work is required to make these walls weathertight and durable. Further investigation is necessary, including the systematic survey of all risk locations, to

determine causes and the full extent of moisture penetration, timber damage and the repairs required.

- 6.3.3 The authority has also noted its concerns about the fixings to the EIFS backing sheets, which were ‘in excess of manufacturer’s specifications’. However, I accept the expert’s opinion that the fixings have not resulted in any apparent problems.

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 moisture penetration and decay in at least two areas of the untreated timber framing. Consequently, I am satisfied that the house does not comply with Clause E2 of the Building Code. In addition, the extent of any damage to the structural framing needs investigation to determine the buildings’ compliance with Clause B1 Structure.
- 6.4.2 The building envelope is also required to comply with the durability requirements of Clause B2. Clause B2 requires that a building continues to satisfy all the objectives of the Building Code throughout its effective life, and that includes the requirement for the house to remain weathertight. Because the cladding faults on the house are likely to allow the ingress of moisture in the future, the building work does not comply with the durability requirements of Clause B2.
- 6.5 I consider that final decisions on whether code compliance can be achieved for the EIFS walls to this house by either remediation or re-cladding, or a combination of both, can only be made after a more thorough investigation of the cladding and also of 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 causes, extent, level and significance of the timber decay to the untreated framing. Once that decision is made, the chosen remedial option should be submitted to the authority for its approval.
- 6.6 I note that the Department has produced a guidance document on weathertightness remediation⁸. I consider that this guide will assist the owner 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 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 house during 2000.

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

- 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.
- 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 The authority should issue a notice to fix that requires the owners to bring the house into compliance with the Building Code, identifying the defects listed in paragraph 5.5 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 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 I 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 applicants 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 matters. That proposal should follow the investigations described in paragraph 6.5. 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 envelope does not comply with Clauses E2 and B2 of the Building Code 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 28 March 2011.

John Gardiner
Manager Determinations