



Determination 2010/099

Refusal to issue a code compliance certificate for a house with monolithic and brick veneer cladding at 9 Nicholas Gibbons Drive, Manukau City



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 applicant is the owner, M Salmon (“the applicant”), and the other party is the Manukau 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 an 8-year-old house, because it is not satisfied that the building work complies with certain clauses² of the Building Code (First Schedule, Building Regulations 1992). The authority’s primary concerns about the compliance of the building appear to relate to its age and to the weathertightness of the cladding.
- 1.3 The matter to be determined³ is therefore whether the authority was correct to refuse to issue a code compliance certificate for the building work. In deciding this, I must consider:

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.

³ Under section 177(b)(i) of the Act (prior to 7 July 2010)

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 cladding, the brick veneer, the windows, the roof tiles 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 In making my decision, I have considered the applicant’s submission, the reports of the applicant’s building consultant (“the consultant”), 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 which is two-storeys high in part and is situated on a level site in a corrosion and high wind zone for the purposes of NZS 3604⁴. Construction is conventional light timber frame, with a concrete floor slab, concrete block foundations, brick veneer and monolithic wall claddings, aluminium windows and concrete tile roofing.

2.2 The house is fairly complex in plan and form, with a two-storey central section. Single-storey wings extend to the east and west; intersecting at 30° with the central section. The 25° pitch gabled and hipped roofs have eaves and verge projections of about 500mm overall.

2.3 A deck, with a timber slat floor, extends to the south from the upper level. The deck is supported on timber posts and the balustrades are timber, with glass panels between the uprights and handrails.

2.4 The two-storey south wall and the other upper walls are clad in monolithic cladding that consists of 7.5mm thick fibre-cement sheets fixed directly through the building wrap to the framing, and finished with a textured coating system. A texture-coated polystyrene band is planted at inter-storey level on the two-storey south wall.

2.5 The expert extracted a sample of timber from the inter-storey boundary joist and the laboratory analysis revealed that the timber was boron treated to an equivalent of H1.2. However, the expert and the applicant’s consultant both concluded that the majority of the exterior wall framing is unlikely to be treated. Given the date of framing installation in 2001, I consider the external wall framing to the house is likely to be untreated.

⁴ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

3. Background

- 3.1 The authority issued a building consent (No. 013184) for the house on 13 September 2001 under the Building Act 1991. I have not seen a copy of the consent.
- 3.2 The authority carried out various inspections during construction including an exterior cladding inspection on 27 November 2001 and pre-line inspections on 4 February 2002. The last inspection was recorded on 19 February 2002 and, according to the applicant, the house was substantially completed during 2002.
- 3.3 The applicant sought a code compliance certificate early in 2009, and asked the authority to carry out a final inspection. A building consultancy company contracted to the authority (“the authority’s contractor”) inspected the house on 26 February 2009 and identified some outstanding documentation, with the inspection summary noting the requirement for a ‘weathertightness report’. I have not seen the record of the inspection carried out by the authority’s contractor.

3.4 The consultant’s weathertightness report

- 3.4.1 The applicant engaged a weathertightness consultant (“the consultant”), who inspected the house on 15 March 2009 and provided a report on the cladding on 19 March 2009. The applicant advised that the consultant was recommended to him by the authority’s contractor.
- 3.4.2 The consultant visually inspected the interior of the house, noting no evidence of moisture penetration. Non-invasive moisture testing was carried out, and no elevated readings were recorded. The consultant noted that it generally appeared that:
- the flush-finished fibre-cement cladding was installed to ‘good trade practice and finished to a high standard of workmanship
 - the windows and doors were ‘properly flashed’
 - the cladding was well maintained, with no evidence of moisture penetration.
- 3.4.3 However, the consultant identified a number of cracks in the upper wall cladding, recommending these be repaired to prevent any future moisture penetration. The consultant concluded that the house complied with Clause E2 but not Clause B2.

3.5 The repairs

- 3.5.1 The cracks to the cladding were subsequently repaired, with the surfaces ground back, the areas reinforced with tape and the plaster repaired. According to the plasterer’s producer statement dated 19 November 2009; twelve cracks were repaired and inspected by the consultant prior to the application of textured coating to the areas.
- 3.5.2 The consultant provided a second report dated 20 June 2009. The consultant noted that crack repairs had been ‘completed to a durable and weathertight standard’, with ‘no evidence of durability failure or external moisture’.
- 3.5.3 The consultant noted that his visual assessment revealed no signs of moisture penetration and concluded:

In assessing the above remedial works undertaken, it is reasonable to state the constructed external envelope elements of the dwelling would, on reasonable grounds, comply with NZ Building Code clauses of the period, E2 External Moisture and B2 Durability.

3.6 The authority's refusal to issue the code compliance certificate

3.6.1 The consultant's reports on the cladding, the plasterer's producer statement, and as-built drawings of the deck, and pergola were provided to the authority's contractor and forwarded to the authority. In a letter to the applicant dated 22 October 2009, the authority's contractor responded saying that:

- the fibre-cement cladding was a high risk cladding, and that non-invasive testing for moisture was 'indicative only' and should have been followed up by invasive testing
- unapproved changes to the house would need to be documented
- a producer statement was required for the remedial work to the fibre-cement cladding.

The letter concluded by saying:

Until the above items have been clarified [the authority's contractor] cannot approve compliance for weathertightness and durability as required by the NZ Building Code.

3.6.2 On 17 December 2009, the authority sought approval to visit the site to visually assess the cladding. It is not known if the site visit was completed.

3.6.3 On 21 During January 2010, the applicant received an undated letter from the authority. The letter made detailed reference to the consultant's report, but no reference was made to a site inspection referred to in paragraph 3.6.2. The letter also referred to shortcomings in the consultant's report. The authority said it was refusing to issue a code compliance certificate for the following reasons (in summary):

- no invasive moisture testing and/or destructive investigation undertaken
- the history of past cracking indicating cladding installation defects
- no evidence of jamb seals to doors and windows
- no drainage gap above the window head flashings
- no investigation of curved window head
- no investigation of inter-storey joint
- the ribbon plate to the deck and the balustrade uprights fixed against cladding
- the guttering butted against unsealed fibre-cement
- no investigation of the bottom of apron flashings
- no investigation of penetrations through the cladding
- no vertical control joints in the upper wall cladding
- the thickness of the cladding panels above windows in the brick veneer
- the need for a maintenance programme

- the increased weathertightness risk associated with untreated framing.

The letter referred the applicant to the Department for a determination if he disagreed with the authority's decision.

3.7 The Department received an application for a determination on 7 May 2010. Further information was sought which was received on 13 May 2010.

4. The submissions

4.1 In a statement accompanying the application, the applicant summarised the background to the situation, noting that:

I have passed all inspections that the council has required me to do, my house is not leaky. I have a Weathertightness report that states this and yet I have the council stating they will not issue a code of compliance.

4.2 The applicant provided copies of:

- the consent drawings and as-built drawings
- the authority's inspection summary
- the consultant's reports on the cladding
- the plasterer's producer statement for repairs to the cladding cracks
- the correspondence from the authority's contractor and the authority.

4.3 The authority did not acknowledge the application for a determination and has made no submission.

4.4 A draft determination was issued to the parties for comment on 11 August 2010. Both parties accepted the draft without comment.

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 16 June and 2 July 2010 and provided a report that was completed on 12 July 2010. The expert noted that the house generally appeared to accord with the consent drawings, apart from the deck to the south wall.

5.2 General

5.2.1 The expert noted that the brick veneer walls appeared satisfactory and the recent repair work to the cracks had resulted in a uniform finish to the flush-finish fibre-cement cladding ("the TFC"), although there were some 'patch areas'.

5.2.2 In order to observe the underlying construction, the expert removed small sections of cladding at the polystyrene band to the south wall and also at the flashing between the upper wall TFC and the lower wall brick veneer.

5.3 Windows

- 5.3.1 The windows and doors are face-fixed against the fibre-cement backing sheets, with metal head flashings and no sill flashings. I note that this accorded with the FFC manufacturer's instructions at the time of construction.
- 5.3.2 The expert probed behind the jamb flanges of a window and noted that no seals or sealant was used between the flanges and the backing sheets. The textured coating had been applied after the window installation and no drainage gaps were provided above head flashings or under sill flanges.
- 5.3.3 The expert also noted that the 4.5mm fibre-cement installed above the corner windows to the south corner of the lounge extended over the window head flanges, with no head flashings to those windows.

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 six invasive moisture readings through the FFC at some areas considered at risk, and noted the following elevated readings or signs of moisture:

- 32% under the curved head window to the north elevation
- 32% to 40% in the bottom plate beside the ranchslider to the south elevation
- 17% at the cut-out to the band above the ranchslider, with fungal growth detected in the timber sample (see paragraph 5.4.3)
- mould on the backing sheets at the cut-out at the inter-cladding junction.

Lower readings were between 12% and 13%. Moisture readings above 18% or which vary significantly generally indicate that moisture is entering the structure and further investigation is needed.

- 5.4.3 The expert removed a sample from the boundary joist behind the polystyrene band and forwarded it to a testing laboratory for decay and preservative analysis. The laboratory's report dated 8 July 2010 noted that:
- the sample was boron treated to H1.2 and contained no established decay
 - the sample contained 'prolific fungal growths' indicating elevated moisture exposure over a prolonged period, risking decay in the future
 - boron treatment may have prevented decay in the sample, but nearby untreated timber could be decayed and it is 'vital to establish the limits and causes of affected wood which may require extensive removal of cladding'.

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

General: flush-finished fibre-cement

- there are insufficient vertical control joints installed in the FFC, and some joints to fibre-cement backing sheets coincide with corners of openings

- although remedial work, including retrofitting of one control joint, has been recently carried out, some cracks have just been painted over
- the cladding is fixed with galvanised nails, while stainless steel fixings are required for the corrosive zone of the site
- the flashing between the upper FFC and the brick veneer is not weathertight; with no building wrap overlapping the upstand, no drainage gap and mould apparent on the back of the unsealed sheets
- the top of the inter-storey band is not sufficiently sealed to prevent moisture from penetrating into unsealed joints in the underlying backing sheets
- the ribbon plate and balustrade uprights to the south deck are fixed directly against the FFC, with no allowance for drainage

Windows and doors

- the face-fixed window and door jambs lack seals under the jamb flanges, and sills flanges appear to be sealed against the cladding, with no drainage gaps to allow trapped moisture to escape to the outside
- the ends of head flashings are unsealed in some areas and the upper FFC is sealed against head flashings, with no provision for drainage
- the curved head window to the upper north elevation is not weatherproof, with very high moisture levels recorded below the sill
- the jambs of windows to the brick veneer walls are not sealed against the brick and the south corner windows to the lounge lack head flashings and jamb seals

Roof junctions to flush-finished fibre-cement

- the bottoms of apron flashings are not weatherproof, with inadequate kickouts, unsealed fibre-cement behind the gutter ends and gaps apparent
- the gutters are fixed against unsealed fibre-cement backing sheets
- the FFC above apron flashings have insufficient clearance above the apron and no allowance for drainage from behind the cladding
- there is cracking to the roof tile mortar in some areas.

5.6 The expert considered that more extensive invasive investigation is required, particularly in regard to the past cracking in the FFC and possible decay to the untreated framing.

5.7 A copy of the expert's report was provided to the parties on 8 July 2010.

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 sited in a high wind zone
- the plan and form is fairly complex with some complex roof to wall junctions and two wall claddings
- some walls have monolithic cladding fixed directly to the framing
- a timber deck is attached to the upper level of the house
- the external wall framing is not likely to be treated to a level that provides resistance to decay if it absorbs and retains moisture

Decreasing risk

- the walls have eaves and verges to shelter the cladding.

6.2.2 When evaluated using the E2/AS1 risk matrix, these features show that two elevations of the house demonstrate a moderate weathertightness risk rating and two a high risk rating. I note that, if the details shown in the current E2/AS1 were adopted to show code compliance, the flush-finish fibre-cement 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.

6.3 Weathertightness performance

The flush-finished fibre-cement cladding

6.3.1 It is clear from the expert's report that the FFC wall cladding, including its junctions with the roof, is unsatisfactory in terms of its weathertightness performance, which has resulted in moisture penetration and possible decay to 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 this wall cladding weathertight and durable. Further investigation of the FFC-clad walls is necessary, including the systematic survey of all risk locations, to determine causes and full extent of moisture penetration, any timber damage and the repairs required.

The brick veneer

6.3.3 The brick veneer to lower walls generally 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 relevant areas included in paragraph 5.5.

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 into the

untreated timber framing. Consequently, I am satisfied that the house does not comply with Clause E2 of the Building Code

- 6.4.2 In addition, 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 building work 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.
- 6.4.3 I consider that final decisions on whether code compliance can be achieved for the flush-finished fibre-cement cladding by either remediation or re-cladding, or a combination of both, can only be made after a more thorough investigation of that cladding and the condition of the underlying timber framing. This will require a careful analysis by an appropriately qualified expert, and should include a full invasive investigation of the extent, level and significance of the moisture levels and possible timber decay to the framing. Once the remediation decision is made, the chosen option should be submitted to the authority for its approval.
- 6.4.4 I note that the Department has produced a guidance document on weathertightness remediation⁵. I consider that this guide will assist the owner in understanding the issues and processes involved in remediation work to the flush-finished fibre-cement cladding in particular, and in exploring various options that may be available when considering the upcoming work required to the house.
- 6.4.5 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 house during 2002.
- 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

⁵ 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

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 building'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. The actions of the authority

- 8.1 In seeking the code compliance certificate the applicant was referred to the authority's contractor, who in turn recommended the consultant to the applicant. Remedial work was then undertaken in conjunction with the consultant. The authority's contractor did not accept the completed remedial work and formally advised the applicant what was required to achieve compliance. The matter was then referred back to the authority which gave further detailed reasons why compliance had not been achieved.
- 8.2 The process the applicant was required to follow to date in achieving code compliance appears to be unnecessarily complex and unhelpful. In my view the matter should have been dealt with by a single entity within the authority with a single view as to code compliance. If a consultant was recommended by the authority's contractor, the owner should have had a reasonable expectation that the consultant's findings would be relied upon by the authority.

9. What is to be done now?

- 9.1 A notice to fix should be issued that requires the applicant 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.
- 9.2 In addition, the notice to fix should include the requirement for a full investigation into the extent and the causes of moisture penetration and possible decay in the timber framing, referring also to the need for invasive moisture testing and laboratory testing of framing samples to confirm treatment levels, if any, and to establish the full extent, levels and structural significance of decay to the framing.
- 9.3 I would suggest that the parties adopt the following process to meet the requirements of paragraph 9.1. Initially, the authority should issue the notice to fix. The applicant should then produce a response to this in the form of a detailed proposal produced in conjunction with a competent and suitably qualified person, as to the rectification or otherwise of the specified issues. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

10. The decision

- 10.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the external building 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 26 October 2010.

John Gardiner
Manager Determinations