



Determination 2019/049

The refusal to issue a code compliance certificate for a 20-year-old house with monolithic cladding at 30 Firth View Road, Thames



Summary

This determination considers an authority's refusal to issue a code compliance certificate for a 20-year-old house principally due to concerns about its compliance with Building Code Clause E2 External moisture. The determination considers the authority's reasons for the refusal and whether the items identified by the authority are compliant with the Building Code.

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, Katie Gordon, Manager Determinations, Ministry of Business, Innovation and Employment ("the Ministry"), for and on behalf of the Chief Executive of the Ministry.
- 1.2 The parties to the determination are:
 - the owners of the house, E and C Reason ("the applicants")
 - Thames-Coromandel District Council ("the authority"), carrying out its duties as a territorial authority or building consent authority.
- 1.3 This determination arises from the decision of the authority to refuse to issue a code compliance certificate for a 20-year-old house. The refusal arose because the authority was not satisfied that the building work as completed complies with certain clauses² of the Building Code³. The authority's concerns primarily relate to the weathertightness and durability of the external envelope.

¹ The Building Act, Building Code, compliance documents, past determinations and guidance documents issued by the Ministry are all available at www.building.govt.nz.

² In this determination, references to sections are to sections of the Act and references to clauses are to clauses of the Building Code.

³ First Schedule, Building Regulations 1992

- 1.4 The matter to be determined⁴ is therefore whether the authority was correct to refuse to issue a code compliance certificate for the reasons given in its letter dated 13 July 2010 (see paragraph 3.5.3). In deciding this matter, I must consider whether the external building envelope of the house complies with Clause B2 Durability and Clause E2 External moisture of the Building Code that was in force at the time the building consent was issued. The building envelope includes the components of the systems (such as the wall cladding and the decks) as well as the way components have been installed and work together; I consider this in paragraphs 6.2 and 6.3.
- 1.5 The authority has sought specific documentation which it says is also required for it to confirm compliance. I consider this in paragraph 6.4.
- 1.6 Other compliance matters observed by the expert are noted in paragraph 6.5.
- 1.7 In making my decisions, I have considered:
- the submissions of the parties, including the report of a contractor engaged by the authority to advise on the house (“the contractor”)
 - the report of the expert commissioned by the Ministry to advise on this dispute (“the expert”)
 - the other evidence in this matter.

1.8 Matters outside this determination

- 1.8.1 The building work considered in this determination is limited to that done under consent No. B502001476. This determination does not address the lack of building consent for the recent upper deck alterations, which I leave to the parties to resolve.
- 1.8.2 In its refusal to issue a code compliance certificate, the authority limited its concerns to items listed in its letter of 13 July 2010. This determination does not address other clauses of the Building Code.
- 1.8.3 I also note that the applicants may apply to the authority for a modification of durability provisions to allow the durability periods specified in Clause B2.3.1 to commence from the date of substantial completion of the original house in April 1999 and I leave this matter to the parties to resolve.

2. The building work

- 2.1 The building work consists of a detached house that is two storeys high in part situated on a large site in a very high wind zone⁵ for the purposes of NZS 3604⁶. The drawings and the expert take the main entry as south-facing and this determination follows that convention.
- 2.2 The site slopes steeply down to the west, with a shared driveway providing access from Firth View Road to this house and two other properties further up the hillside. The 3-bedroom house is reasonably complex in plan and form and is assessed as having a high level of weathertightness risk (refer paragraph 6.2.5).

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

⁵ Based on the bracing calculations

⁶ New Zealand Standard NZS 3604:2011 Timber Framed Buildings

2.3 The house accommodates the following:

- In the lower level:
 - the recessed main entry (“the entry deck”), garage, bedroom 1 and ensuite
 - living /dining area opening onto the west and north timber decks
 - kitchen
 - toilet, rear door opening onto the east timber deck.
- In the upper level:
 - bedroom 2 opening onto the enclosed deck (“the conservatory”)
 - a bathroom
 - bedroom 3 opening onto a tiled deck (“the south upper deck”).

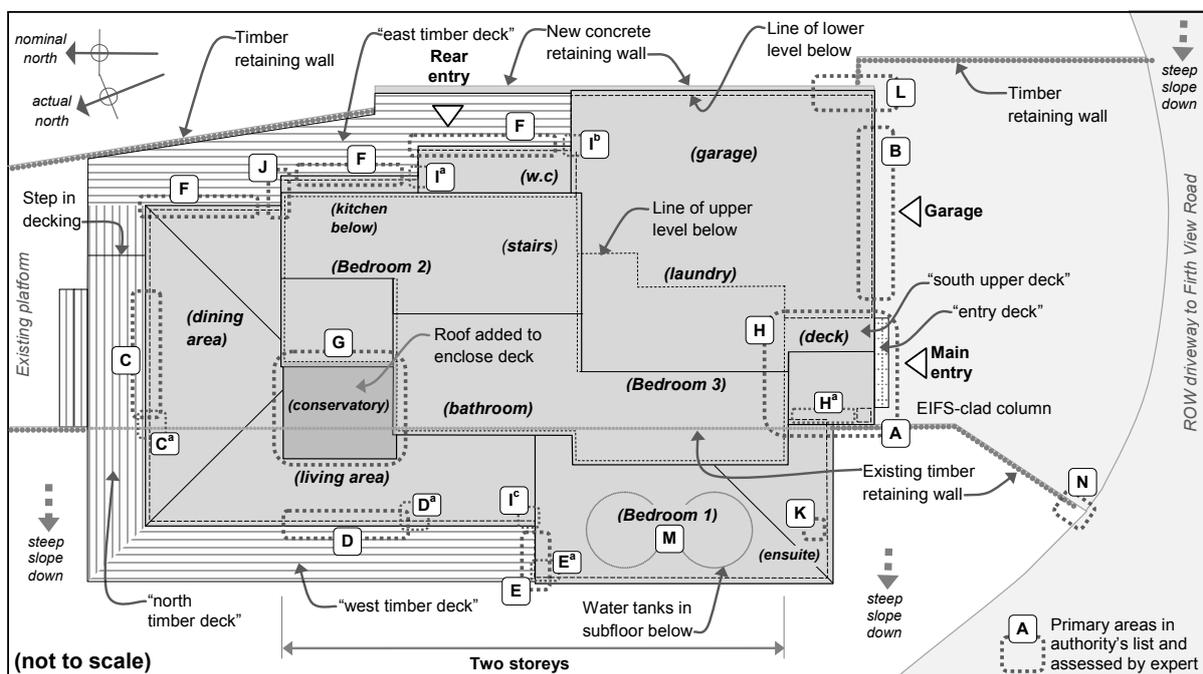


Figure 1: Approximate site plan

- 2.4 Construction is a mix of conventional timber framing and specifically designed elements; with a concrete slab, retaining wall and foundations to the garage and timber pole foundations elsewhere to suit the steep slope of the site. The remaining floors are timber framed. Doors and windows are aluminium and walls are generally monolithic-clad, with sheet fibre-cement cladding to the conservatory. The 30° pitch hipped and gabled roofs are clad in pressed metal tiles.
- 2.5 The drawings and specification call for the framing timber to be ‘dryframe’ and the expert noted timber stamped as such within the roof space, which indicates the use of at least some untreated kiln-dried framing. Given this evidence and the common use of untreated framing when the house was constructed in 1999, I consider that the wall framing is unlikely to be treated to resist fungal decay.

2.6 The expert noted that specification called up H1⁷-treated timber for some framing elements, and given the sound condition of floor joists and similar he considered boron-treated timber had been used (refer paragraphs 5.3.2 and 5.5.1).

2.7 The wall claddings

2.7.1 The wall cladding is a form of monolithic cladding system known as EIFS⁸. In this instance, the proprietary cladding system consists of 40mm expanded polystyrene backing sheets fixed directly through the building wrap to the framing, to which a mesh-reinforced modified acrylic plaster system has been applied. The system includes what appears to be purpose-made flashings to windows, edges and other junctions.

2.7.2 The recent deck alterations included new infill walls to enclose the upper deck, which are now clad in painted V-grooved fibre-cement sheets fixed directly through the building wrap to the framing.

3. Background

3.1 The consent and construction

3.1.1 The authority issued the building consent (No. B502001476) to the applicants on 23 November 1998 under the Building Act 1991 (“the former Act”). The authority’s inspection summary indicates that the authority and/or the engineer carried out various inspections during construction, including:

- footings, poles, retaining wall and floor slab during December 1998
- roof framing in January 1999
- pre-line building in February 1999
- post-line bracing, plumbing and drainage in March 1999.

3.1.2 In a letter to the authority dated 22 April 1999, the engineer confirmed that:

... inspections of the foundations were carried out by us during construction and that they were in accordance with our requirements and the approved plans.

3.1.3 The inspection summary records the first final inspection carried out on 22 April 1999 and adds the following notes:

Final. Building & [Plumbing and Drainage] OK

Minor finishing left in wet areas by owner.

Drain as laid and elect cert to come.

3.1.4 The house was not re-inspected and the applicants remained unaware of any unresolved matters until 2009, when a LIM⁹ report identified the lack of a code compliance certificate and the applicants requested this from the authority.

3.1.5 In a letter to the applicants dated 10 March 2010, the authority confirmed that because of the age of the consent it would be referred to named external consultants to make an assessment (the consultants are not the same entity as the contractor identified in paragraph 1.7). In a letter to the applicants dated 16 April 2010, the contractor confirmed that the authority had engaged it to carry out the assessment.

⁷ Timber treatment class to New Zealand Standard NZS 3602: Part 1: 1995 Timber and wood-based products for use in building (now superseded)

⁸ Exterior Insulation and Finish System

⁹ Land Information Memorandum

3.2 The contractor's report

3.2.1 The contractor provided a report dated 9 April 2010, which included a desktop review of the records together with the results of a site inspection of the house. The desktop review described consent documentation and construction inspections and noted that (in summary):

- the house has high weathertightness risk, with membrane decks
- the consent conditions included:
 - engineer to inspect the foundations and provide producer statement
 - maintenance and service contract required for the wastewater treatment system
- there was no producer statement for the direct-fixed EIFS, nor an as-built drainage plan.

3.2.2 The contractor visited the site on 3 May 2010 and the report noted (in summary):

- subfloor fixings still performing despite signs of corrosion
- polystyrene subfloor insulation used in lieu of foil
- subfloor framing appears to be boron-treated
- upper tiled deck falls to scupper then piped, with overflow, to exterior gutter
- direct-fixed EIFS appears well installed with adequate wall/flashing clearances
- internal non-invasive moisture readings 'averaged 12% - 13%'.

3.2.3 The report referred to attached photographs and stated that the following areas were "Not compliant with code":

- inadequate cladding clearances to paving
- inadequate cladding clearances to timber decking
- inadequate slope to tiled decks
- inadequate threshold clearances at upper deck doors
- parapet cappings to upper decks lack a slope
- ends of apron flashings inadequate
- cracks at cladding junctions.

3.2.4 The contractor recommended that the authority reject the application for a code compliance certificate.

3.3 The applicants' response to the contractor's report

3.3.1 On 6 May 2010, the applicants provided a letter dated 4 May 2010 from the wastewater company, which confirmed that the wastewater treatment system had been regularly serviced since installation in early 1999, noting specific repairs carried out in 2007 and 2009.

3.4 In regard to the requirement for a producer statement construction review, the engineer and the original builder advised the applicants 'that in 1999 a PS4¹⁰ did not exist and that the foundations would have been signed off' by [the authority]'.

¹⁰ Producer Statement – Construction Review

(I note producer statements existed in 1999; they are expressly referred to in the Building Act 1991 where they are defined, in section 2, as ‘any statement supplied by or on behalf of an applicant for a building consent or by or on behalf of a person who has been granted a building consent that certain work will be or has been carried out in accordance with certain technical specifications’.)

3.5 The 2010 refusal to issue a code compliance certificate

- 3.5.1 The authority initially refused to issue a code compliance certificate in a letter to the owners dated 11 May 2010, but provided no detailed reasons for that refusal and the applicants challenged the decision.
- 3.5.2 On 13 May 2010 the applicants provided a letter to the authority asking why the house was not signed off at the final inspection in April 1999 and challenged the basis of the report completed by the contractor.
- 3.5.3 In a letter to the applicants dated 13 July 2010, the authority again refused to issue a code compliance certificate but gave its reasons for the refusal as below (for clarity I have assigned reference numbers shown in brackets):

Items related to the cladding

There is inadequate ground clearance between the cladding and adjacent ground levels. **[Item 1]**

There is inadequate clearance between the timber decking and wall cladding. **[Item 2]**

There is inadequate slope on the membrane deck and we are unable to establish the type of membrane used. **[Item 3]**

Tiles have been adhered to the membrane deck; there are concerns with the compatibility of the membrane and adhesive used. **[Item 4]**

The floor level between the dwelling and deck has been compromised. **[Item 5]**

The barrier parapet flashing has inadequate fall. **[Item 6]**

Apron flashings have not been formed to adequately divert stormwater into the guttering. **[Item 7]**

A couple of cracks were observed in the cladding and it is unclear what maintenance (if any) has been carried out since the dwelling was completed. **[Item 8]**

Items related to documentation

A producer statement construction review is required for the observation of the foundation walls (B Grade masonry) and excavations. **[Item 9]**

Producer statement construction required for the installation of the deck membrane. **[Item 10]**

Producer statement construction required for the installation of the cladding system. **[Item 11]**

Evidence that the [wastewater treatment] system has been maintained and serviced since it was installed. **[Item 12]**

As-built drainage plan required. **[Item 13]**

- 3.5.4 The authority also noted the high rate of weathertightness failure for the type of cladding used and concluded that it was ‘unable to confirm or be satisfied on reasonable grounds that the building work complies with the consented plans and the building code for the reasons listed above’.

3.6 The 2015 deck alterations and other repairs

3.6.1 No action was taken until the upper deck was enclosed to form a conservatory (no consent was sought for that work). At the same time other repair work and maintenance was carried out. It is not clear when this work was carried out, but the applicants advised the expert that the deck was enclosed ‘about four years ago’. The 2015 work appears to have included:

- enclosure of the upper deck (Area G):
 - original walls, doors, parapet cappings, inner EIFS cladding and tiled floor retained
 - new aluminium windows installed above original parapet cappings
 - new infill wall framing and exterior sheet cladding as required
 - new roof, which the expert was unable to assess
- kick-outs to the bottom of apron flashings (Areas I^a, I^b, I^c and J)
- various sealant repairs to leaking joinery junctions
- decayed sections of north deck door reveals replaced (Area C)
- EIFS cracks sealed and house repainted.

3.7 The applicants asked the authority to review the situation, but the authority’s decision remained unchanged. Further correspondence failed to resolve the situation and the Ministry received an application for a determination on 18 April 2019.

4. The submissions

4.1 The initial submissions

4.1.1 The applicants’ submission dated 16 April 2019 noted that they had asked the authority “for a letter stating ‘why they have refused to issue a [code compliance certificate]’” but had been told that the contractor’s 2010 report provided those reasons. However, the applicants considered that:

This does not explain why the final sign off did not take place in 1999. Our builder and ourselves have no correspondence relating to this matter. We do not understand why the final sign off was not given and why we were not contacted if there was an issue at that time.

4.1.2 The applicants provided copies of:

- the building consent dated 23 November 1998, the consent drawings and specification
- the authority’s inspection summary
- the engineer’s letter dated 22 April 1999
- the LIM provided on 27 October 2009
- the contractor’s report dated 9 April 2010
- the wastewater company’s letter dated 4 May 2010
- the refusal to issue a code compliance certificate dated 13 July 2010
- correspondence between the parties, various other correspondence, statements and information.

4.1.3 The authority made a submission dated 26 April 2019, which set out the background to the dispute and included the following comments in response to the applicants' comments (in summary):

- No re-inspection was sought following the first final inspection in 1999. Although it is an owner's responsibility to obtain 'sign-off for a building project', no new application for a code compliance certificate has been received since the refusal.
- Under the former Act, a code compliance certificate can be issued if the authority was 'satisfied on reasonable grounds that the work complies with the Building Code'.
- The contractor's desk top review included assessing the risk of relevant attributes of the house design prior to inspecting the cladding.
- The applicants have not yet confirmed that all outstanding work identified in the refusal to issue a code compliance certificate has been completed.

4.1.4 The authority concluded that:

[The code compliance certificate] was refused in 2010 for reasons specified in the refusal letter 13 July 2010. As [the authority] has not received confirmation that all outstanding work has been completed, [the authority] sees no reason to alter its opinion a further nine years later.

4.2 The draft determination and the submissions received

4.2.1 A draft determination was issued to the parties for comment on 26 July 2019. The authority accepted the draft without comment on 29 July 2019.

4.2.2 The applicants accepted the draft determination subject to non-contentious comments received on 7 August 2019. The applicants submitted, in summary:

- they were told the upper deck alterations did not require consent because its 'area was under 5m'
- the letter dated 10 March 2010 referred in paragraph 3.1.5 had not been received
- in Area E the carpet is dry and there is 'no sign of water' but the doors to the space are continually open during the summer. The ensuite and flooring was installed in 2016. No water ingress was observed to bi-fold doors to the living area when this area was recarpeted in 2011.
- why was the low height of the balustrade not identified by the authority during its inspection?
- water on the drive 'is coming from two other properties'. Water that leaves the wastewater system (via the irrigation field) is treated
- the surface water system was checked and emptied in 2015, and an aerator pump installed.

4.2.3 The applicants raised others matters where they considered the draft was incorrect or misrepresented the situation. I have amended the determination as appropriate. The applicants advised that a builder would be asked to address some of the matters raised.

4.2.4 On 14 August 2019 the authority made a further submission advising:

- an authority building inspector was last on site for the final inspection on 22 April 1999
- no building consent applications had been received for any repair work
- the non-compliant balustrade height had not been identified in the final inspection carried out in April 1999, but ‘it remains [non-compliant]’
- the authority considered the letter to the applicants (see paragraph 3.1.5) advising the authority would engage outside consultants to assess the building was received by the applicants as the letter was not returned undelivered. A letter dated 13 May 2010 was received from the applicants in response to the contractor’s report.

5. The expert’s report

5.1 General

5.2 As mentioned in paragraph 1.7, 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 17 June 2019, providing a report completed on 11 July 2019, which was forwarded to the parties on 12 July 2019.

5.2.1 The expert noted that ‘the overall architectural shape and form of the building’ (see Figure 1) appeared ‘largely in accordance with the consented drawings’. The expert observed the following discrepancies:

- the upper deck to Bedroom 2 has been closed in (Area G)
- the east exterior steps to rear entry are not installed (as they were not required) and timber decking now extends from the rear entry to meet the north timber deck
- drawings call for the south upper deck to be ‘Coved [bituminous membrane] on plywood with formed gutter at front edge of deck’, but deck tiles are installed to discharge water run-off over the front edge (Area H).

5.2.2 The expert considered construction quality to be average; with exterior cladding and internal linings ‘reasonably straight and fair’. ‘Other than a significant error with the deck construction’, the expert noted that the ‘building has generally been finished to an acceptable trade standard, with the paintwork in reasonable condition’. The house appeared to be ‘well-presented and maintained’.

5.2.3 The aluminium joinery is face-fixed against the framing and recessed by the thickness of the EIFS, with PVC¹¹ head flashings, sealed jambs and sloping sills. The expert noted that installation appeared to accord with the manufacturer’s 1997 details, with no visible cracking or evidence of moisture problems and no invasive investigation was undertaken.

5.3 Moisture investigations

5.3.1 The expert limited invasive readings to 9 sample areas associated with observed defects and/or concerns identified by the authority, with 3 readings from 8% to 13%.

¹¹ Polyvinyl chloride

Elevated readings and signs of damage were recorded as follows (with locations as per Figure 1 shown in brackets):

- 96% and heavily decayed flooring at the north deck doors (Area C^a)
- 20% in water stained floor joist below the above (Area C^a)
- 91% and decayed flooring and bottom plate at the west deck doors (Area D^a)
- 18% in water stained flooring beside Bedroom 1 deck door (Area E^a)
- 19% in soffit framing below the south upper deck (Area H^a)
- 27% in framing below the end of the east apron flashing (Area J)
- 18% in skirting beside the ensuite shower cubicle (Area K).

5.3.2 The expert carried out further investigation by removing carpet, underfloor insulation and accessing subfloor/ceiling spaces in a number of areas as follows (see Figure 1):

- At the south entry deck (Area A), the expert noted:
 - a dark recess between garage west wall cladding and deck tiles suggested a waterproofing membrane upstand had been installed at the junction
 - heavily water-stained framing and fibre cement sheet in the subfloor area below the above junction, with timber damage suspected. The appearance of the deck joists suggests these may be boron-treated only
 - however, the condition of the garage west bottom plate (13% moisture reading and sound timber drillings) indicated a lack of water penetration through the wall/floor junction to date.
- At the north deck doors (Area C), the expert noted:
 - a section of decayed door reveal adjacent to decayed flooring had been replaced and the aluminium door frame west joint had been sealed about 4 years ago (Area C^a)
 - testing showed that water ran from the frame onto the outer channel, which was butted against the EIFS reveal
 - decking is installed hard under EIFS, which has trapped moisture at the vulnerable junction
 - removal of underfloor insulation revealed damaged flooring and a water stained floor joist.
- At the west deck doors (Area D), the expert noted:
 - a section of decayed door reveal adjacent to decayed flooring had been replaced by the original builder some 18 years ago and the outer door channel/EIFS junction had been sealed (Area D^a)
 - timber decking is installed hard under EIFS, trapping moisture at junction where ageing sealant had deteriorated
 - particle board at south end of the doors was ‘heavily decayed’ and disintegrating¹² and water staining was also observed at the north end
 - the untreated bottom plate was ‘highly decayed’, with fragments able to be ‘easily removed with a hand tool’.

¹² The two locations of the disintegrating particle board flooring are very close to walls (so unlikely to received someone’s full weight) and are not thought to be a safety concern at this point in time.

- At the Bedroom 1 deck door (Area E):
 - an elevated 18% moisture reading was taken at the north-west corner, with water stains observed from the subfloor (Area E^a)
- At the south upper deck (Area H):
 - the deck tiles are adhered to a membrane that extends out to wrap around the front edge of the deck
 - a membrane upstand is visible from the adjacent garage ceiling space
 - there is no obvious cause(s) for the 19% moisture reading in the soffit framing below the clad west balustrade (Area H^a).

5.4 The expert addressed the authority's reasons for refusing to issue a code compliance certificate outlined in its letter dated 13 July 2010; and paragraphs 5.5 to 5.11 summarise his findings (with references and associated areas per Figure 1 provided in brackets).

5.5 EIFS to paving clearances (Item 1)

5.5.1 In regard to the tiled entry deck (Area A), the expert noted (in summary):

- EIFS cladding butts against the tiles and minimal threshold clearance is provided at front door, but some protection is provided by the deck soffit above
- entry deck level is higher than the garage floor but a membrane upstand is installed at the wall/tile junction, with 13% moisture reading in adjacent garage bottom plate indicating no water penetration into wall framing to date
- there are no signs of water damage to particle board flooring in the south-east corner of Bedroom 1 wardrobe adjacent to the entry deck
- framing is exposed to water penetration at the south-east corner of the deck and is heavily water-stained. The framing is likely to be damaged as it appears to be boron-treated rather than CCA¹³-treated.

5.5.2 In regard to the south garage wall (Area B), the expert noted (in summary):

- cladding clearances beside the door are minimal and well below the 150mm in manufacturer's recommendations at the time and also NZS 3604 in force at the time
- there is a recess formed in the concrete floor slab at the garage entry, with bottom plates set at floor level – which gives some separation from paving
- the east wall of the garage is a concrete retaining wall
- there are no signs of water entry or damage on the inside of the garage walls.

5.6 EIFS to timber deck clearances (Item 2)

5.6.1 In regard to timber decking extending from the rear garage door around the north to the deck door from Bedroom 1 (see Figure 1), the expert noted (in summary):

- particle board flooring extends over boundary joists, which appear to be H1-treated as called for in the specification
- bottom plates to untreated wall framing are installed over particle board

¹³ chromated copper arsenate preservative

- in comparison with manufacturer's instructions at the time:
 - the EIFS cladding extends close to 50mm below floor level, but the angle flashing shown at decking/wall junction has not been installed
 - the required clearance shown below the EIFS cladding has not been provided, with decking installed hard against the bottom of the EIFS
- the lack of drainage traps water at the deck/cladding junction without a flashing to stop moisture from migrating into the particle board flooring and framing
- at the east timber deck (Area F):
 - the decking is set at a lower level which reduces the risk of damage
 - however, contact between wet decking and EIFS will still result in deterioration from water trapped against the cladding.

5.6.2 Moisture investigations described in paragraph 5.3 revealed:

- at the north and west deck doors (Areas C^a and D^a):
 - past replacement of decayed sections of sill/jamb reveals
 - saturated timber and flooring, with particle board damaged and disintegrating at two locations
 - decayed bottom plate above one area of disintegrating particle board
 - timber joists appear in comparatively good condition, but are likely to be partly decayed from prolonged contact with saturated particle board
- at Bedroom 1 door onto west deck (Area E^a):
 - slightly elevated moisture in the north-west corner
 - particle board is water stained.

5.7 The decks (Items 3 to 6)

The enclosed deck

5.7.1 In regard to the upper bedroom deck (Area G), the expert noted (in summary):

- the deck was converted into a conservatory about 4 years ago
- the original walls and tiled floor remain, with new aluminium windows installed above the original parapet flashings
- infill timber framing is clad in V-grooved fibre-cement sheet, which 'appears to be satisfactorily installed, with gutters fitted over fascia, head flashing and aluminium joinery'
- the roof could not be seen due to height constraints, but the cladding below the aluminium joinery was visible and appeared to be satisfactorily installed.

The south upper deck

5.7.2 In regard to the south upper deck (Area H), the expert noted (in summary):

- an EIFS-clad framed column extends from ground level to roof above, with clad balustrade (Area H^a) to the west and an open steel balustrade to the south
- Acceptable Solution for Clause F4, F4/AS1, in effect in 1998 required a minimum barrier height of 1000mm for external decks and the consented drawings called for that height

- the steel balustrade is more than 1000mm high, but the west balustrade is only 950mm high
- the EIFS-clad balustrade (Area H^a) is flashed with flat-topped metal capping; which butts against wall cladding and does not appear well sealed, but moisture readings below the junction are low at 8%, with sound timber drillings
- the 1.5° slope provided to the tiled deck floor meets BRANZ¹⁴ recommendations¹⁵ and exceeds the 10mm fall noted on drawings
- EIFS/tile clearances vary from 8 to 10mm and threshold clearance is about 40mm, with shelter provided by deep roof overhang above the door
- an under-tile membrane is visible from roof space behind cladding and extends out to the south edge and around the plywood substrate edge
- despite lacking a gutter or drip edge, the south edge appears well sealed and a moisture reading in framing under edge/wall junction was low at 8%
- a slightly elevated moisture level of 19% was recorded in soffit framing below the clad west balustrade – with no obvious cause of water entry (Area H^a).

5.8 Apron flashings (Item 7)

5.8.1 Apron flashings are installed at junctions of lower roofs with upper walls as shown in Figure 1 and kick out flashings were retrofitted about 4 years ago.

5.8.2 In regard to roof/wall junctions at the north east kitchen corner (Area J), the expert noted (in summary):

- the EIFS cladding is sealed to metal tiles at the end of the lean-to roof above
- the EIFS cladding is not well sealed to the timber fascia which is overdue for painting
- the end of the lower gutter is sealed against the EIFS and a past crack between the fascia and the end of the apron flashing has also been sealed and painted
- there are no internal signs of moisture penetration into the north-east corner of the upper level Bedroom 2
- however a moisture reading of 27% was recorded below the apron flashing, with damp but apparently sound timber shavings and ‘visibly wet’ polystyrene
- the source of the moisture could not be confirmed.

5.8.3 In regard to the other apron flashings, the expert noted (in summary):

- the ends of gutters lack clearance from the cladding at the other two east apron flashing junctions (Areas I^a and I^b)
- the end of the west gutter is sealed against Bedroom 1 north EIFS, below the retrofitted kick out flashing (Area I^c)
- there are no signs of moisture penetration on the cladding below the gutter or in roof space on the other side of the wall.

¹⁴ Building Research Association of New Zealand

¹⁵ BRANZ Good Tiling Practice - published October 1996.

5.9 Cracks to cladding (Item 8)

5.9.1 In regard to the authority's concerns regarding several cracks observed in 2010, the expert noted that (in summary):

- Despite a fine vertical crack below the south-east corner of the south upper deck (Area H), moisture readings in framing below were 8% with sound drillings. A cladding crack between fascia and gutter on the east elevation (Area J) has been sealed and painted. No other cracks were noted.

5.10 Other cladding matters

5.10.1 In regard to other cladding matters, the expert noted that (in summary):

- Although there is no head flashing or drip edge above the garage door, the head and jamb cladding junctions at the timber reveals look well sealed, with no evidence of moisture penetration (Area B).
- Although the top rail of the timber retaining wall butts the EIFS to the garage and may cause cladding deterioration, the garage wall below this junction is concrete masonry and there is little risk of damage to framing above the junction (Area L)
- Sealant is visible behind the heat pump conduit fixings. Although the hose tap penetration lacks a flange, the junction appears well sealed.

5.11 Documentation required (Items 9 to 13)

5.11.1 The expert noted (in summary):

- In regard to construction review of foundations (Item 9):
 - garage blockwork appears structurally sound, with no indication of non-compliance
 - retaining wall and subfloor structure looked in good order, with no indication of any non-compliance

(I note that the engineer confirmed his inspections by letter).

- In regard to the EIFS cladding system (Item 10):
 - the EIFS system appeared to be generally reasonably well installed, with satisfactory window installation and penetrations, but a number of compliance issues have been identified
- In regard to upper deck membranes (Item 11):
 - membrane is wrapped up walls and around the substrate at the south edge
 - cladding junctions appear well sealed with no evidence of moisture ingress
 - the adequacy of the membrane is no longer relevant to the conservatory.

5.11.2 In regard to evidence of the wastewater treatment system's maintenance (Item 12):

- the treatment system was installed largely as described in the building consent
- the lines in the disposal field run down slope and while there was some suggestion the treated water could be migrating towards the drive, there was no evidence of treated water or odour adjacent the lower section of the field.

(I note that the wastewater company confirmed servicing and maintenance since installation – refer paragraph 3.3.1. Photographs in the expert’s report show the irrigation disposal field to be purpose-made pipe which water will only exit under pressure and not via gravity - so it is not affected by the sloped ground to the same extent as a gravity-fed system.)

5.11.3 In regard to an as-built drainage plan (Item 13), the expert noted (in summary):

- wastewater drains directly to the treatment system described above
- surface water from the roof drains into two water tanks in the subfloor area and an overflow runs to the driveway (Area M)

5.12 Other items

5.12.1 The expert noted the following additional items (in summary):

- The 18% moisture reading in skirting adjacent to the ensuite shower cubicle indicates the junction is leaking (Area K).
- There is no smoke detector within 3m of Bedroom 1¹⁶.
- Timber trusses, building paper and roof underlay appear to be in good condition and ceiling insulation is well-fitted.

5.13 The expert’s conclusions

5.13.1 In relation to the cladding the expert considered that the “following defects affecting building code compliance were noted”:

- inadequate clearances between the cladding and the ground at the garage and front entry (Areas A and B)
- inadequate clearances between the cladding and timber deck (Areas C to E)
- in regard to the EIFS-clad balustrade to the south upper deck (Area H^a):
 - the height of the balustrade is insufficient
 - the balustrade cap flashing lacks a slope
 - there is a leak into the soffit framing below the balustrade
- leaking apron flashing/gutter junction north-east kitchen corner (Area J).

5.13.2 In relation to the remaining matters the expert found:

- the clad balustrade at 950mm high did not meet Clause F4 Safety from falling.

5.13.3 In relation to the documentation required by the authority the expert found (aside from the EIFS cladding):

- the deck membranes were performing adequately
- there were no indications that the surface water and wastewater treatment systems were not performing adequately
- there were no indications that the foundations and foundation walls were not performing adequately.

¹⁶ Smoke detectors were not required by the Building Code at the time the consent was issued in 1998 and cannot be enforced as a requirement of the consented work. However, I strongly suggest the applicants provide these in accordance with current requirements.

6. Discussion

6.1 Compliance generally

- 6.1.1 The building consent for this house was issued under the former Act, and the transitional provisions of the Act accordingly apply when considering the issue of a code compliance certificate for work completed under this building consent. Section 436(3)(b)(i) of the transitional provisions of the current Act requires the authority to issue a code compliance certificate only if it ‘is satisfied that the building work concerned complies with the building code that applied at the time the building consent was granted’.
- 6.1.2 In assessing the above, I have taken into account the age(s) of various elements in the house. An application can be made to the authority for a modification of durability requirements to allow durability periods for the house to commence from the date of the first final inspection in April 1999 (see paragraph 3.1.3). Although that matter is not part of this determination (see paragraph 1.8.3), I have taken the anticipated modification into account when considering compliance as most components appear to have continued to perform for some 20 years.
- 6.1.3 The matter in dispute is whether the authority was correct to refuse to issue the code compliance certificate for this house. In deciding this matter I have considered those areas of building work identified by the authority as reasons for its refusal in its letter dated 13 July 2010; in order to reach conclusions on whether those areas comply with the relevant clauses of the Building Code that applied at the time the consent was granted.

6.2 The requirements of Clauses E2 and B2

- 6.2.1 The functional requirement for Clause E2 (at the time the consent was issued) was:
- E2.2** *Buildings* shall be constructed to provide *adequate* resistance to penetration by, and the accumulation of, moisture from the outside.
- In respect of the building’s external envelope the performance requirement (at the time the consent was issued) was set out in Clause E2.3.2 as follows:
- E2.3.2** Roofs and exterior walls shall prevent the penetration of water that could cause undue dampness, or damage to *building elements*.
- 6.2.2 A breach of Clause E2.3.2 can arise from either damage to building elements or undue dampness; it does not require both. In various past determinations¹⁷ I have considered the term “undue dampness” to be a level of moisture that has, or will, result in detrimental effects on building elements, or the building occupants, or both.
- 6.2.3 The functional requirement for Clause B2 (at the time the consent was issued) was:
- B2.2** *Building* materials, components and *construction* methods shall be sufficiently durable to ensure that the building, without reconstruction or major renovation, satisfies the other functional requirements of this code throughout the life of the *building*

Clause B2.3.1 sets out the periods for which building elements must, with only normal maintenance, continue to satisfy the performance requirements of the Building Code.

¹⁷ For example Determination 2014/062

6.2.4 The evaluation of the external building envelope for compliance with the Building Code and the risk factors regarding weathertightness have been described in numerous previous determinations. This house has the following environmental and design features, which influence its weathertightness risk profile:

Increasing risk

- the house is two storeys high in part and is sited in a very high wind zone
- the house is fairly complex in plan and form, with multiple roof levels and decks that result in complex junctions
- there are no roof overhangs to shelter the wall cladding
- the EIFS cladding is directly fixed to the framing timber
- the framing timber is not treated to resist decay.

Decreasing risk

- the remaining upper level tiled deck is sheltered beneath a roof overhang.

6.2.5 Using the E2/AS1¹⁸ risk matrix to evaluate these features, the house is assessed as having a high level of weathertightness risk and would require a drained cavity if details shown in the current E2/AS1 were adopted to show code compliance. However, this was not a requirement at the time the original building consent was issued in 1998.

6.2.6 I consider that the expert has found sufficient evidence to show that a number of areas require significant attention. Taking account of the expert's report, I am satisfied that the following areas require further investigation and repair:

- cladding clearances at the garage and front entry (Areas A and B)
- cladding to timber deck clearances (Areas C to F)
- the inadequate height of the EIFS-clad balustrade (Area H^a)
- investigation and repair in regard to moisture penetration at:
 - soffit framing below the clad west balustrade (Area H^a)
 - framing below the east apron flashing/gutter junction (Area J)
 - framing and flooring adjacent to timber decking (Areas C to E).

I note that the expert's assessment of the building envelope was limited to the matters identified by the authority and is not to be considered a full weathertightness assessment of the building.

6.3 Conclusion

6.3.1 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 over an extended period with significant timber damage to several areas of framing and flooring. Consequently, I am satisfied that the cladding did not comply with Clause E2 External moisture for the minimum 15-year period required by Clause B2 Durability.

¹⁸ The Acceptable Solution E2/AS1 for Clause E2 External moisture

- 6.3.2 While Clause B2 requires the cladding to remain weathertight for a minimum of 15 years, the expected life of the building's structure is considerably longer, and the building envelope is required to protect the underlying structure of the house for a minimum period of 50 years. The damaged timber framing draws into question compliance with B1 Structure, and I am not satisfied that Clause B1 has been met with respect to Clause B2.
- 6.3.3 I note that the Ministry has produced a guidance document on weathertightness remediation¹⁹. 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.

6.4 The required documentation

- 6.4.1 The authority is of the view that various producer statements and the like are now required to establish compliance. There is no basis in the Act for an authority to require producer statements to be provided: producer statements can be offered by an owner. An authority accepts a producer statement at its discretion if it believes it is reasonable to do so.
- 6.4.2 Producer statements, certificates, warranties or similar can provide evidence to assist an authority in deciding the adequacy of various components or systems, but these should not be relied on to the exclusion of other evidence of compliance.
- 6.4.3 To deny a code compliance certificate solely due to the lack of documentation for work carried out more than 20 years ago appears to me to be unreasonable and such statements are now of limited value, particularly when taking into account:
- The Building Code is performance based and account must be taken of the in-service performance of components and systems as observed by the expert (refer paragraphs 5.11 and 5.13.3)
 - the current relevance of the documentation for work that is now 20 years old
 - the practical considerations in obtaining the documentation.

6.5 Other compliance matters

- 6.5.1 The expert's assessment revealed elevated moisture levels in the skirting adjacent to the shower cubicle in the ensuite bathroom. Although the 20-year-old junction between the skirting appears to have complied with Clause E3 for the minimum 15 years required by Clause B2, the junction will need to protect the underlying wall framing for a further 30 years to meet the minimum required life of 50 years for the structure of the house and attention to appropriate maintenance is now required.

6.6 F4 Safety from falling

- 6.6.1 The relevant performance requirement for Clause F4 in force at the time the consent was issued says:
- F4.3.4** Barriers shall:
- (a) ...,
 - (b) Be of appropriate height,

¹⁹ Weathertightness: Guide to remediation design (May 2011). This guide is available at www.building.govt.nz

- 6.6.2 The expert noted the 950mm high EIFS-clad balustrade to the south upper deck was less than the 1000mm minimum required for such barriers by paragraph 1.1 F4/AS1, being the Acceptable Solution for Clause F4 also in force at the time the consent was issued.
- 6.6.3 F4/AS1 provided design solutions for barriers that would comply. However, it is important to note that other barrier designs, which did not appear in F4/AS1, may have achieved compliance provided that the elements that make up the barrier were configured in such a way that the performance requirements of Clause F4 were met.
- 6.6.4 As noted in past determinations, such as 2012/025²⁰, there is a relationship between a barrier's height and its width, where a barrier's width (not less than 150mm) can compensate for a barrier being less than the required height (to a minimum of 762mm).
- 6.6.5 The relationship is described in NBS IR76-1131, the US *Model Performance Standard for Guardrails* issued by the National Bureau for Standards ("the US standard"). While the US Standard is not New Zealand legislation, it provides a useful tool to assist in assessing compliance and alternative solution proposals.
- 6.6.6 The US Standard has a criterion (in A3.2) for height in relation to width as follows (inches converted to millimetres):
- The height requirement stipulated in Criterion A3.1 [1063mm]²¹ may be relaxed under the following conditions:
- (a) If the top surface of the guardrail is horizontal and has a width greater than [152.4mm] and the floor surface of the interior adjoining region is level, the minimum height H of the guardrail shall not be less than,
- $H = K - B$, where B is the minimum width of the top surface of the guardrail and K is [1219mm]. However in no case, shall the minimum height be less than [762mm]
- 6.6.7 The expert did not note the barrier's width, but this is estimated to be around 200-250mm. Using the methodology described in the US standard, and assuming the narrower estimated balustrade width, the minimum acceptable height, H, is:
- $H = K - B$, where $K = 1219\text{mm}$, and $B = 200\text{mm}$
- $H = 1219 - 200 = 919\text{mm}$
- 6.6.8 The balustrade is 950mm high and therefore meets the US standard, which, for the reasons given above I consider is an adequate height to also meet Clause F4.3.4(b). However, as the actual width of the barrier needs to be confirmed on site and I leave this to the parties to resolve.

6.7 Other compliance matters

- 6.7.1 The expert's assessment revealed elevated moisture levels in the skirting adjacent to the shower cubicle in the ensuite bathroom. Although the 20-year-old junction between the skirting appears to have complied with Clause E3 for the minimum 15 years required by Clause B2, the junction will need to protect the underlying wall framing for a further 30 years to meet the minimum required life of 50 years for the structure of the house and attention to appropriate maintenance is now required.

²⁰ Determination 2012/025 Compliance of barriers to a bridge located on a former film set (4 April 2012)

²¹ The US Standard has a minimum barrier height of 1067mm, instead of the 1000mm required by F4/AS1. Therefore, any barrier meeting the requirement of the US Standard exceeds the requirement of the Building Code

6.8 The failure to issue the code compliance certificate in 1999

6.8.1 The applicants consider the authority was remiss in not issuing the code compliance certificate in 1999 (refer paragraph 4.1.1). The consent was issued under the former Act which was in effect until November 2004. Under section 43(1) of that Act an owner was required seek a code compliance certificate as soon as practicable after the building work had been completed.

6.9 Maintenance

6.9.1 Effective maintenance of the house is important to ensure ongoing compliance with the Building Code and is the responsibility of the building owner. The Ministry has previously described maintenance requirements associated with the external building envelope, including examples where the external wall framing of the building is not treated to a level that will resist the onset of decay if it gets wet (for example, Determination 2007/60).

7. What happens next?

7.1 I note that the building consent was issued to the current owners of the house, and a notice to fix is therefore able to be issued in respect of breaches of the Act related to work carried out. Alternatively, the authority may elect to deal with the matter via a second notice issued under section 95A of the Act. Any notice should include the investigations and defects identified in paragraphs 6.2.6 and refer to any further defects that might be discovered in the course of investigation and rectification, but not specify how those defects are to be fixed – that is a matter for the applicants to propose and for the authority to accept or reject.

7.2 A detailed proposal should be developed and submitted to the authority for its approval. The proposal should be produced in conjunction with a suitably qualified person experienced in weathertightness remediation. The proposal should be submitted to the authority for its consideration and approval.

8. The decision

8.1 In accordance with section 188 of the Building Act 2004, I hereby determine that, in regard to the Building Code that was in force at the time the building consent was issued in 1998:

- the exterior building envelope has failed to comply with Clauses E2 External moisture with respect to Clause B2 Durability
- the structure of the house has failed to meet Clause B1 Structure with respect to Clause B2 Durability

and accordingly, I confirm the authority's decision to refuse to issue a code compliance certificate for the house.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 15 October 2019

Katie Gordon
Manager Determinations