



## Determination 2019/020

# The refusal to issue a code compliance certificate for a 16-year-old house with monolithic cladding at 7 Second Avenue, Devonport, Auckland



### Summary

This determination considers an authority's refusal to issue a code compliance certificate for a 16-year-old house principally for reasons to do with the performance of the building envelope. 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 2004<sup>1</sup> ("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 owner of the building, the Florence Family Trust acting through an agent of the trust ("the applicant")
- Auckland Council<sup>2</sup> ("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 16-year-old house. The refusal arose because the authority is not satisfied that the building work complies with certain clauses<sup>3</sup> of the Building Code (First Schedule, Building Regulations 1992). The authority's concerns primarily relate to the weathertightness and durability of the wall cladding.

<sup>1</sup> The Building Act, Building Code, compliance documents, past determinations and guidance documents issued by the Ministry are all available at [www.building.govt.nz](http://www.building.govt.nz) or by contacting the Ministry on 0800 242 243.

<sup>2</sup> Before the application was made, North Shore City Council was transitioned into Auckland Council. The term authority is used for both.

<sup>3</sup> In this determination, references to sections are to sections of the Act and references to clauses are to clauses of the Building Code.

- 1.4 The matter to be determined<sup>4</sup> is therefore whether the authority was correct to refuse to issue a code compliance certificate for the reasons given in its letter dated 1 February 2018 (see paragraph 3.3). In deciding this matter, I must consider:
- (a) 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 elements of the envelope (such as the wall cladding, the windows, the decks, the parapets and the roof cladding) as well as the way components have been installed and work together.
  - (b) Whether other items identified by the authority comply with certain parts of the Building Code that was in force at the time the building consent was issued: namely Clauses E3 Internal moisture, F4 Safety from falling, and F7 Warning systems.
- 1.5 In making my decisions, I have considered the submissions of the parties, the report of the expert commissioned by the Ministry to advise on this dispute (“the expert”) and the other evidence in this matter.

## 1.6 Matters outside this determination

- 1.6.1 The authority’s refusal to issue a code compliance certificate was limited to items associated with the clauses outlined above. Except for several items observed by the expert, this determination does not address other clauses of the Building Code.
- 1.6.2 I note that the applicant 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 in June 2003. Although I leave this matter to the parties to resolve in due course, I have taken the age of the house into account when considering the performance of the claddings.

## 2. The building work

- 2.1 The building work consists of a detached house that is two-storeys high but comprises a number of levels in each storey. The house is situated on an elevated site adjacent a harbour. The expert and the consented drawings take the garage door and main entry as south-facing and this determination follows that convention. The house is complex in plan and form and is assessed as having a high to very high weathertightness risk<sup>5</sup>.
- 2.2 The house steps down a sloping site with specifically engineered reinforced concrete foundations and concrete block retaining walls. The foundations and slabs are separated by a 1200mm wide ‘drain influence zone’ to allow for a council sewer, with the garage at the highest level to the eastern end of the site.
- 2.3 The remaining construction is light timber frame, with timber framed floors that include specifically engineered steel elements, monolithic wall cladding, aluminium windows, profiled metal roofing and two small areas of membrane roof. As shown in Figure 1, the bulk of the house is divided into two wings with an atrium between that includes a ‘bridge’ over the void beneath the atrium glazed roof.

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<sup>4</sup> Under sections 177(1)(b) and 177(2)(d) of the Act

<sup>5</sup> The weathertightness risk is calculated using the risk matrix in Acceptable Solution for Clause E2, being E2/AS1.

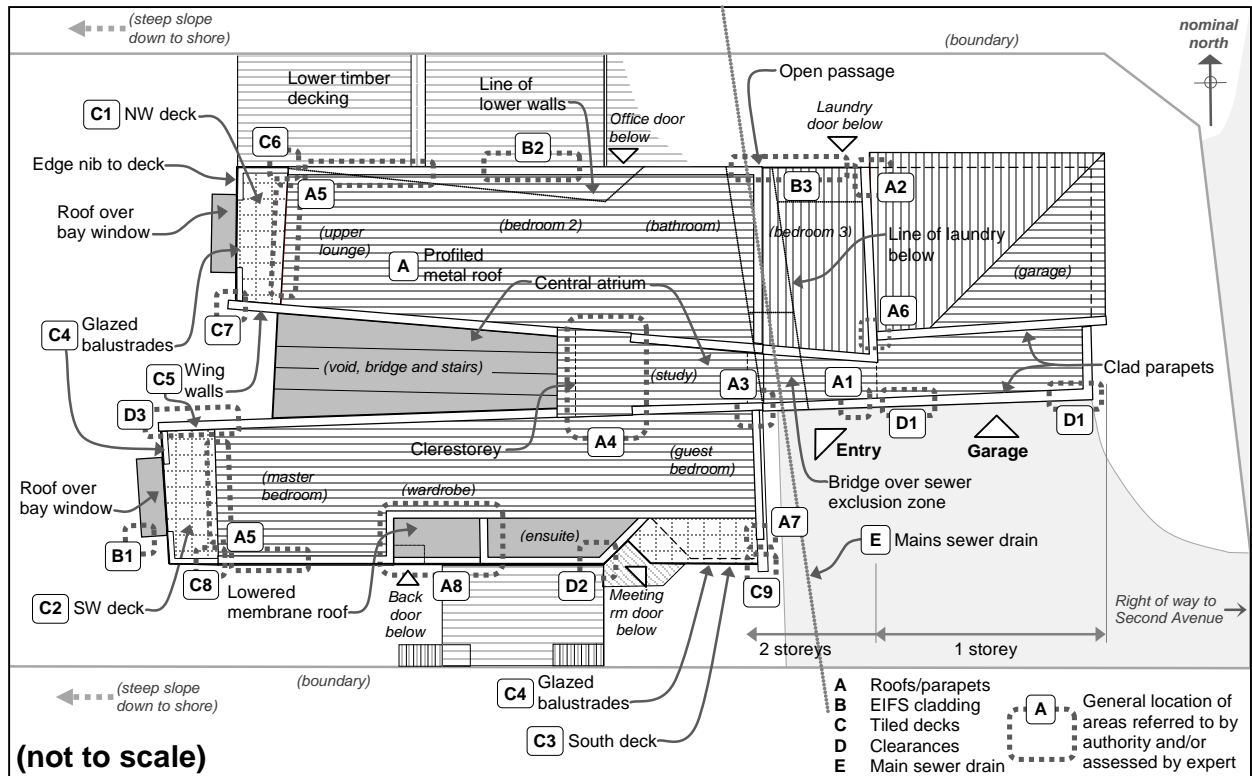
2.4 The house accommodates the following main levels:

**On the lower floor:**

- entry, kitchen/dining, lounge, family room, bedroom and en suite, toilet, laundry, office, meeting room, the lower level of the atrium space, and the garage.

**On the upper floor:**

- Four bedrooms, one with en suite and walk-in wardrobe, toilet and bathroom, lounge, office/library, upper level of the atrium and an atrium bridge, and three decks.



**Figure 1: Approximate site plan**

2.5 As shown in Figure 1, the roof is generally clad with profiled metal with two small areas of membrane over west bay windows. Mono-pitched roofs fall to the west above the north and south wings, while the east-sloping atrium roof glazing extends up to a clerestory window. At the north-east end of the upper floor, the roof falls to the north above bedroom 3. Roof overhangs are limited to the 450mm eaves to the north and east of the hip roof over the single-storey garage.

## 2.6 The EIFS cladding

2.6.1 The wall cladding is a form of monolithic cladding system known as EIFS<sup>6</sup>. In this instance, the system appears to be an established proprietary system consisting of 60mm polystyrene backing sheets fixed directly to the framing over the building wrap and finished with a mesh-reinforced plaster system and acrylic paint system. Vertical grooves are formed in the back of the polystyrene sheets. The EIFS installation instructions, current at the time of construction, include purpose-made flashings to windows, edges and other junctions.

<sup>6</sup> Exterior Insulation and Finish System

2.6.2 Most external walls extend up to form metal-capped sloping and flat parapets. EIFS parapets also extend above the roof to separate areas as shown in Figure 1. Parapets to the north and south atrium glazed roof extend to the west as wing walls (Area C5) with EIFS-clad openings adjacent to the west decks (C1 and C2). Glazed inserts in the wing wall openings raise the barrier heights of the latter. An east parapet is stepped down (Area A7) and slopes as a wing wall to the south deck (C3).

## 2.7 The decks

2.7.1 The house includes three upper level decks, with top-fixed metal and glass handrails, situated above ground floor rooms. The consent drawings called for a proprietary coloured waterproofing PVC<sup>7</sup> sheet membrane system intended to remain exposed. However, tiles are directly adhered to an unknown type of underlying membrane.

- Deck C1: deck edges include raised nibs to the south and north-west corner, with the tiles draining over the west edge onto the bay window roof below. Metal and glass balustrades are top-fixed through edge nibs and tiles. An EIFS-clad wing wall extends along the south edge of the deck (Area C5). A glazed insert in the wing wall opening raises the barrier height of the latter.
- Deck C2: has a wing wall to the north edge and features similar to those described above.
- Deck C3: the deck floor drains to an external gutter, with metal balusters top-fixed through the tiles.

2.7.2 Timber slat decking extends along parts of the north and south elevations, with timber stairs, steps and retaining walls accommodating level changes. Further decking is installed at the door to the lower level meeting room and as a ‘bridge’ over the drainage exclusion zone at the main entry recess.

## 2.8 Timber treatment

2.8.1 The specification called for timber to comply with NZMP 3640<sup>8</sup>, with low hazard framing timbers to be ‘H1’<sup>9</sup>. The expert noted that:

Untreated kiln dried framing ... complied with NZMP 3640 and was commonly installed in 2002, however the slow rate of decay noted on most of the sampled framing with elevated moisture levels suggested there may be some level of preservative treatment present... Only the heavily decayed deck soffit framing suggested a lack of treatment...

2.8.2 When the framing of this house was installed in 2002, NZS 3640<sup>10</sup> classified the primary risk as insect attack, with H1 level treatment required to achieve a minimum level of boron of 0.04% (in contrast to 0.4% for the current H1.2 level treatment). Given the lack of evidence, the framing of this house is unlikely to be treated to a level that will provide significant resistance to fungal decay.

<sup>7</sup> Polyvinyl chloride

<sup>8</sup> New Zealand Standard NZMP 3640:1992 – Specification of the minimum requirements of the NZ Timber Preservation Council Inc.

<sup>9</sup> Hazard class H1 as defined in NZMP 3640 for use “where timber, including plywood, is used out of contact with the ground and in situations which are adequately ventilated and continuously protected from the weather by roofs or external walls. The primary risk to timber in this situation is from attack by wood-boring beetles...”

<sup>10</sup> New Zealand Standard NZS 3640:2003 – Chemical preservation of round and sawn timber.

### **3. Background**

#### **3.1 Construction**

3.1.1 The authority issued the building consent (No. BB/04324/02) to the applicant on 15 February 2002 under the Building Act 1991 (“the former Act”). The authority carried out various inspections during 2002 including:

- footings, floor slabs and retaining walls during March and April 2002
- drainage during April and May 2002
- framing and insulation in September 2002
- pre-line building and plumbing in October 2002.

3.1.2 A ‘part final’ inspection was carried out on 6 June 2003, which identified work to be completed and noted that a ‘recheck’ inspection was required. There are no records of further inspections until 2017.

#### **3.2 The 2017 inspections**

3.2.1 The authority inspected the house on 19 July 2017 and issued a ‘residential final checklist’ and noted that the 6 June 2003 ‘site instructions’ had been ‘cleared’. The record included photographs and identified 9 items that needed rectifying, including adjusting ground levels, handrails to stairs, barrier to block wall, sealing vanity sinks and some minor plumbing items.

3.2.2 Most outstanding matters were rectified and the authority re-inspected the house on 9 October 2017. The inspection record noted that the inspection had passed, with ‘no further inspection required’ but noted two minor items to ‘fit bolts and washers ... to baluster’, ‘fit uv cover to water pipes’ needed to be completed.

#### **3.3 The 2018 refusal to issue a code compliance certificate**

3.3.1 Based on the outcome of the 2017 inspections, the applicant assumed the code compliance certificate had been issued. The authority carried out a ‘durability final inspection’ on 30 January 2018, which excluded the roof due to the lack of safe access. The authority took non-invasive moisture readings and photographs during the inspection (which I have not seen).

3.3.2 In a letter to the applicant dated 1 February 2018, the authority advised that ‘under Section 95A of the Building Act 2004 a code compliance certificate cannot be issued at this stage’ because ‘[the authority] could not be “satisfied on reasonable grounds” that building works comply with the NZ Building Code, or that it is performing as intended.’

3.3.3 The authority identified some items that required attention, which are listed in Table 1 (refer paragraph 6.5.1), including the requirement of certain documentation. The section 95A letter said someone experienced in weathertightness assessment and remedial design must provide “a report / scope of works and any recommendations to [the authority] for further review”.

3.3.4 The applicant sought advice from the design architect (“the architect”) and some work was carried out in response to the section 95A letter.

3.3.5 In a statement dated 15 November 2018, the architect responded to the authority’s section 95A letter noting remedial work undertaken including sealing penetrations and unblocking wall cavities; installing parapet cappings, barriers, and downpipe

spreaders; decreasing openings to stairs, removing climb points to barriers, ground levels reduced, relocation of LPG cylinder, etc. The architect noted elements that were installed in accordance with the consent (top-fixed membrane penetrations), and items that had performed adequately (deck falls, deck thresholds) and documentation that had been obtained (drainage, gas and electrical certificate). The architect noted some items in the authority's section 95A letter were unable to be identified (refer paragraph 6.5.1).

### **3.4 The inspection company's report**

3.4.1 The applicant also engaged a property inspection company ("the inspection company") that carried out non-invasive thermal imaging and moisture testing of the house on 6 October 2018 and provided a report dated 26 November 2018.

3.4.2 The report noted that the purpose of the inspection 'was to assess the general condition of the building based on the limited visual inspection' and was 'intended only as a general guide'.

3.4.3 The inspection detected no thermal anomalies and all moisture readings were within the 'dry range' except for an area beside the full-height window to the lower guest room (Area D2). Given the lack of thermal anomalies or significant defects, the report suggested that 'this may be false readings relating to a possible metal plate or fixings.'

3.4.4 In regard to exterior wall claddings the report identified risk areas that should be monitored and required maintenance, including:

- some corroding screw fixings in the metal roofing
- several visible cracks in the EIFS cladding (Areas C6, A2)
- lack of clearance of timber decking to cladding
- top-mounted deck balustrades (Areas C4).

### **3.5 The application for a determination**

3.5.1 The applicant was unable to resolve the situation and the Ministry received an application for a determination on 16 November which was accepted on 20 November 2018.

3.5.2 The Ministry sought a copy of the property inspection report from the applicant, which was received on 28 November 2018 (see paragraph 3.4). The Ministry also sought a copy of the property file from the authority, which was received on 29 January 2019.

## **4. The submissions and the draft determination**

### **4.1 The initial submissions**

4.1.1 In submissions dated 9 November 2018, the applicant set out the background to the situation and included the following comments (in summary):

- The code compliance certificate process was never finalised when the building was completed in 2003. The final re-inspection on 9 October 2017 passed and the record noted 'no further inspection required' and the applicant took no further action.

- The authority carried out another inspection, which resulted in a letter that listed a large number of items. Most have now been remedied, but some are not easily identifiable or “may be impossible to remedy” (such as the top-fixed balustrades).
- The authority also said that “invasive and destructive testing” is required for every wall. The authority did not accept the property inspection report.
- The house was built well and “has weathered well over the last 15 years and will continue to do so”.

4.1.2 With and following the application, the applicant provided copies of:

- the specification and the resource consent drawings
- some inspection records for 2002 and 2003
- the final re-inspection summary dated 9 October 2017
- the ‘Durability final inspection checklist’ dated 30 January 2018
- the authority’s refusal to issue a code compliance certificate dated 1 February 2018
- the architect’s response to the authority’s refusal dated 15 November 2018
- the inspection company’s report dated 26 November 2018
- various other statements and certificates.

4.1.3 The authority made no submission in response to the application but forwarded a digital copy of the property file on 29 January 2019, which included copies of additional records pertinent to this determination, including:

- the building consent
- the building consent drawings
- inspection records.

## **4.2 The draft determination and submissions received**

4.2.1 A draft determination was issued to the parties for comment on 1 March 2019.

4.2.2 The authority accepted the draft subject to non-contentious comments on 14 March 2019.

4.2.3 The owner accepted the draft determination on 15 March 2019, and advised they would prepare a detailed proposal to be provided to the authority in conjunction with a member of the New Zealand Institute of Building Surveyors.

## **5. The expert’s report**

### **5.1 General**

5.1.1 As mentioned in paragraph 1.5, I engaged an independent expert to assist me. The expert is a member of the New Zealand Institute of Building Surveyors and inspected the house on 21 December 2018. The report was completed on 27 January 2019 and was forwarded to the parties on 30 January 2019.

- 5.1.2 The expert considered construction quality was of a 'reasonable trade standard; with exterior cladding and internal linings 'reasonably straight and fair', and cladding penetrations and joinery junctions 'well sealed'.
- 5.1.3 Although the house appeared to be 'generally well presented and maintained to a reasonable standard', the expert noted that the exterior had been repainted about a year ago and the maintenance history before this was unknown.
- 5.1.4 The expert noted that 'the overall architectural shape and form of the building is largely in accordance with the consented drawings', with observed discrepancies including:
- butyl rubber membrane roofs to bedroom 3 and entry/south garage changed to profiled metal
  - carport constructed as enclosed garage
  - upper south triangular projection deleted and ensuite wall extended to align with upper guest room, with parapets added
  - roof parapet cladding changed from a proprietary aluminium panel system to EIFS
  - kitchen and dining room locations swapped
  - extensive changes to window and door joinery locations, layout and sizing.

## 5.2 Features impacting on weathertightness

- 5.2.1 In regard to the risk profile of the house, the expert included the following comments on features that increase or decrease weathertightness risks (in summary):
- The house is two-storeys high stepped down the slope with multiple split-levels.
  - The multi-level house is highly complex in form, with many corner junctions, roofs at multiple levels, many high-risk junctions, specialized atrium glazing and corner windows.
  - There are no eaves overhangs, except for the north and east garage walls, various recessed areas and an oblique eave above the clerestory window.
  - The site is elevated and exposed to a harbour.
  - Three upper-level decks are located over habitable spaces below. The deck membranes are tiled, and the decks have top-fixed balustrades.
  - The EIFS cladding is direct-fixed to the framing, with vertical grooves in the rear face that allows some drainage from behind the cladding via weepholes at the base.
  - The EIFS cladding is generally well maintained and in good condition having been repainted about a year ago.
  - There are parapets on all elevations. Walls extend up to form parapets and some upper walls terminate within boundaries of lower exterior walls.
  - Some framing is likely to be treated although treatment level is unknown.



### 5.3 Moisture investigations

5.3.1 At the applicant's request, the expert limited the number of invasive readings through the EIFS cladding, taking 19 invasive moisture readings into framing at sample areas considered at risk of moisture penetration and/or associated with concerns identified by the authority.

5.3.2 I note that 10 readings from north, west and south elevations varied from 9% to 13%<sup>11</sup>, which indicates a likely equilibrium range of about 10% to 12%. Moisture levels that vary significantly from equilibrium levels generally indicate that external moisture is entering the structure and investigation is needed.

5.3.3 Readings significantly above equilibrium levels were recorded as follows (with locations as per Figure 1 shown in brackets):

- 73% in the entry soffit framing, with 36% at the upper guest bedroom corner/atrium roof junction above the entry (Area A3)
- 29% in the east wing wall to the south deck (Area C9)
- 23% below a top-fixed baluster to the south-west deck (Area C8)
- 21% below a top-fixed baluster to the north-west deck (Area C7)
- 17% to 18% in the stepped soffit framing below bedroom 2 (Area B2)
- 16% below the vertical/sloping parapet junction in the east wing wall to the south deck (Area A7).

(I note the inspection was carried out in summer and moisture levels are expected to increase during wetter seasons).

5.3.4 The expert carried out further investigation of the following areas (see Figure 1):

- In regard to the entry area (Area A3):
  - soffit linings were damp and framing had a 'highly elevated' 73% moisture level, with drillings appearing damp and partly decayed
  - the parapet/roof junction directly above this soffit was poorly sealed with no upstand to the capping end. However, the source of the 73% reading is likely to stem from an apron flashing junction above this at the north-east corner of the guest bedroom where 36% moisture levels were recorded.
- In regard to the east stepped wing wall to the south deck (C3):
  - a high moisture level of 29% was recorded in framing at south-east corner below the south deck (Area C9)
  - the drill shavings were damp but otherwise there was no obvious decay
  - no indication of any leaking was found on soffit linings below the other end of the deck
  - 16% was recorded below 'well sealed' junction of uncapped 30° sloped top with vertical face in south wing wall (Area A7).
- In regard to the south-east baluster to the south-west deck (Area C8):
  - an elevated moisture reading of 23% was taken below the top-fixed balustrade post at the south-east corner of the south-west deck
  - slope and threshold were similar to the north deck.

<sup>11</sup> The moisture content bands identify the likelihood of timber decay. For example, moisture content levels of up to 18% generally will not support timber decay. Refer *Weather-tightness: Guide to the Diagnosis of Leaky Buildings* (May 2011), Department of Building and Housing.

- In regard to the south baluster to the north-west deck (Area C7):
  - an elevated moisture reading of 21% was taken below the south top-fixed balustrade post at the south wing wall to the north-west deck
  - drill shavings were damp but otherwise there were no signs of obvious decay.
- In regard to the deck/wall junction above the family room (Area C6):
  - the family room ceiling is freshly waterstained, following heavy rain that apparently overflowed the gutter (Area A5) above onto the deck
  - there is a vertical crack in the north deck fascia and the balustrade posts are top-fixed through flat nib walls around the deck, but the moisture level was only 13% in deck framing below the baluster adjacent to the crack
  - a section of the soffit linings had broken off, exposing heavily decayed framing and an ant nest within the building envelope
  - further investigation is needed to confirm the source of the leaking.
- In regard to the soffit framing below bedroom 2 (Area B2):
  - moisture readings of 17% to 18% were taken in the soffit overhang
  - green mould was observed around the drainage weepholes at the bottom of the EIFS cladding at the soffit step down
  - the drill shavings appeared partly decayed at one location.

## 5.4 The roofing and flashings

### 5.4.1 The expert noted in regard to the roof claddings:

- the profiled metal roofing is screw-fixed, including high wind restraint washers to the upper roofing
- spreaders have been installed to downpipes discharging onto lower roofs
- in regard to the north-west and south-west corner gutters (Areas A5):
  - roofs to north and south wings drain into gutters that wrap around the north-west and south-west corners, gutters are mounted on timber fascia boards that are face-sealed to the cladding
  - despite the lack of flashings the junction between the fascia boards and the cladding appeared to be well sealed and performing adequately (further investigation was not possible due to height constraints)
- in regard to the rain head at the south garage/entry parapet wall (Area A1):
  - the low-pitched metal roofing drains into an internal gutter at the parapet
  - a 75mm diameter outlet and 44mm diameter overflow drain from the internal gutter through the parapet and into a rain head, but the overflow is about 60mm above the main outlet pipe, and the close proximity increases the risk of both pipes being blocked
  - the rain head includes a 30 x 100mm overflow slot, which is also undersized when compared against the Acceptable Solution for Clause E1, being E1/AS1
- a similar undersized rain head overflow the small southern roof (Area A8) is considered acceptable in the circumstances because the collection area of the

roof is small. (I note a photo on the expert's report shows this roof adjacent a large tree with the gutter full of leaves. The gutter overflow also drains into the rain head.)

- maintenance is needed to the metal roofing in regard to:
  - a few corroding roof screws
  - lichen growth
- in regard to the atrium roof (Area A4):
  - the roof glazing drains to a gutter on the west, with gaps at the ends of the gutter to allow overflow if needed and stop ends installed to the apron flashings
  - the glazed roof rises to a clerestory window at the top, which has reverse sloping eaves on the west elevation, with a 25mm drip edge to the fascias
  - there is no flashing at the wall/soffit junction, which is vulnerable to wind-driven rain
  - low moisture readings of 10% indicate adequate performance to date, despite the lack of a flashing at junction of the wall and reverse eaves.

5.4.2 The expert noted in regard to the parapets:

- apron flashings are installed at parapet/roofing junctions, with kick-outs at the bottom of the flashing upstands to divert water away from the cladding
- apron flashing junctions are riveted and appear to be well sealed except for the parapet/roof junction directly above the leaking entry soffit (Area A3).

## 5.5 The EIFS installation

5.5.1 Based on the expert's limited investigations the following were noted (in summary):

- The wall cladding appears to be a proprietary 60mm direct-fixed EIFS with vertical grooves in the rear face and weepholes in the base moulding to allow drainage from behind the cladding.
- In regard to the soffit to the wall recess to north laundry/garden area (Area B3):
  - there is a crack in the cladding at the garage eave, with many ants present although moisture recorded at only 10% (A2)
  - the bottom edge of the cladding above the recess lacked drainage weepholes, but there was no indication of any moisture ingress resulting from the lack of cavity drainage.
- All penetrations appear to be well sealed.
- In regard to the aluminium joinery:
  - the joinery is recessed by the thickness of the cladding and appears to be performing adequately, with no indication of water ingress
  - the aluminium sill is sealed to the EIFS and lacks a drainage gap required by the EIFS installation details
  - given the drainage plane down the back of the cladding, arising from the grooves in the rear face of the EIFS system, the sealed sill junction does not appear critical.

(I note a low moisture reading was recorded below the south west corner to the bay window (Area B1). However, the bay windows have some protection from

gutters directly above which reduces their exposure and lessens the need for drainage gaps to sills. This may not be the case for more exposed windows.)

## **5.6 The decks**

5.6.1 In regard to the upper level decks, the expert noted that (in summary):

- the slopes of the tiled floors are minimal, with 0.6° fall measured on the north-west deck (C1)
- there is little cladding clearance at the deck floor/wall junctions, in contrast to the 40mm clearance required in the EIFS installation instructions
- the threshold clearance (at 48mm) is less than the 60mm floor clearance required in the EIFS installation instructions
- although the EIFS installation instructions showed top fixing of a handrail into a 15° sloping top surface, glazed balustrades to C1 and C2 decks are top-fixed to flat-topped plastered nibs or through the deck tiles where the west decks drain over the edges to bay window roofs below
- the handrails to the south deck (C3) are fixed through the tiles, with the deck floor draining over the deck edge to a gutter
- the north-west and south-west decks (C1 and C2) have wing walls (Areas C5), which include large EIFS-clad openings with flat ‘sills’, but no indication of moisture ingress
- elevated moisture levels were recorded and investigated as outlined in paragraph 5.3
- there is no drainage gap at the timber decking/wall junctions.

## **5.7 Ground clearances (D)**

5.7.1 The expert noted in regard to ground clearances (in summary):

- the EIFS installation instructions required 225mm clearance between floor level and unpaved surfaces
- ground levels at garage door jambs need to be further reduced (Areas D1)
- a low 11% moisture reading was taken in the lower guest bedroom area identified by the inspection company (see paragraph 3.4.3), and the cladding outside the bedroom did not raise any concerns (Area D2).

## **5.8 Other items**

5.8.1 The expert noted in regard to Clause F4 – Safety from falling:

- internal glass and aluminium balustrades are installed on the stairs and ‘bridge’ in the central atrium, with handrails fixed to walls
- although timber strips have been fitted below stair treads to reduce openings in the stair to less than 100mm, there are some gaps between the balustrades and stair treads larger than 100mm diameter
- fixed shelving has been removed from in front of the 1.0m high barrier to the study above the void to the entry area.

### 5.8.2 The expert noted in regard to the other items:

- Clause B1 – Structure:
  - minor cracks visible in the exposed solid concrete floor slabs appear to be shrinkage related, rather than indicative of any structural defect
- Clause E3 – Internal moisture:
  - (I note that consent drawings do not show waterproofing details or specify any particular waterproofing membrane system to the showers in the house)
  - a visual inspection of adjacent walls and ceilings directly below the bathrooms revealed no evidence of leaking membranes at wall plates outside the bathrooms or below upper level bathrooms
  - no issues noted and tiling appears to have performed satisfactorily for the past 15 years
- Clause G11 – Gas as an energy source:
  - the kitchen gas bottle is relocated to the exterior
- Clause G12 Water supplies:
  - the two hot water cylinders have been fitted with restraining straps
- Clause F7 – Warning systems (smoke detectors):

(I note that the provision of domestic smoke detectors in the Acceptable Solution for Clause F7 Warning systems, F7/AS1, did not come into effect until April 2003.)

  - smoke alarms are installed within 3m of bedrooms 1, 2 and 3 and the upper guest bedroom
  - there is a smoke alarm 2.8m from the lower guest bedroom but the location is below the bridge on the other side of the atrium
  - there is no smoke alarm within 3m of the office or meeting rooms, and both rooms can be used as sleeping spaces.

## 5.9 The expert's conclusions

### 5.9.1 The expert considered that the following matters required attention:

- leaking deck junctions (Areas C6, C7, C8 and C9)
- undersized internal gutter overflow (Area A1)
- cracked plaster to the EIFS cladding (Areas A2 and C6)
- inadequate ground clearances (Areas D1)
- internal barrier installation (to stairs and at study east barrier)
- inadequate smoke alarm installation.

### 5.10 The expert also commented on specific items identified by the authority in its section 95A letter (see paragraph 3.3) and I address those comments in Table 1 (paragraph 6.5).

## **6. Discussion**

### **6.1 Compliance generally**

6.1.1 The building consent considered in this determination was issued under the former Act, and accordingly the transitional provisions of the Act apply when considering the issue of a code compliance certificate for work completed under this 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 The matter in dispute is whether the authority correctly exercised its power in its decision to refuse to issue the code compliance certificate for these alterations. In deciding this matter I have therefore considered whether the areas of building work identified by the authority in its section 95A letter (see paragraph 3.3) comply with the relevant clauses of the Building Code that applied at the time the building consent was granted.

### **6.2 Clauses B2 Durability and E2 External moisture**

6.2.1 The evaluation of the external building envelope for compliance with the Building Code and the risk factors considered in regard to weathertightness have been described in numerous previous determinations (for example, Determination 2004/01<sup>12</sup>).

6.2.2 This house has environmental and design features that influence its weathertightness risk profile, as noted in the expert's report (refer paragraph 5.2.1).

6.2.3 It is acknowledged that the cladding has been in place for more than 15 years and therefore in excess of the minimum 15-year durability period required for the cladding under Clause B2.3.1(b) - assuming the durability periods in Clause B2.3.1 are modified to commence from when the building was substantially completed.

6.2.4 I consider the expert has found sufficient evidence to show that the cladding has not satisfied Clause E2 for the minimum 15-year period specified in Clause B2. Taking account of the expert's report, I am satisfied that the following areas require further investigation and/or repair:

- the top-fixed balustrades to upper decks
- cracked cladding at north garage roof/laundry recess junction (Area A2)
- lack of cavity drainage to the bottom of the EIFS cladding (Area B3)
- the lack of a drainage gap under the window sills to exposed windows
- inadequate ground clearances to the south garage wall (Area D1)
- investigation and repair in regard to moisture penetration into:
  - the ceiling below cracked EIFS at the north-west deck/wall junction (Area C6)
  - the north-west deck/wing wall junction below the top-fixed baluster (Area C7)
  - the south-west deck/wall junction below the top-fixed baluster (Area C8)

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<sup>12</sup> Determination 2004/01 Refusal of a code compliance certificate for a building with a "monolithic" cladding system (11 March 2004).

- the south-east corner below the south deck (Area C9)
- the entry recess soffit below the unsealed apron flashing (Area A3)
- the soffit framing below bedroom 2 (Area B2)
- deficiencies in the rain heads installed to parapet walls (Areas A1, A8).

### **Conclusion**

6.2.5 I consider the expert's report establishes that the current performance of the building envelope is not adequate because there is evidence of ongoing moisture penetration into a number of areas of the timber framing, with timber damage to several areas. Consequently, I am satisfied that the cladding did not comply with Clause E2 for the minimum 15-year period required by Clause B2.3.1(b) and is currently allowing moisture ingress.

## **6.3 Maintenance**

6.3.1 The house is also required to comply with the durability requirements of Clause B2, which requires a building to satisfy all Building Code objectives throughout its effective life. Clause B2 includes a requirement for wall claddings to remain weathertight for a minimum of 15 years, but the expected life of the underlying structure is considerably longer.

6.3.2 Careful maintenance is therefore needed to ensure that the cladding continues to protect the underlying framing for its minimum required life of 50 years for the structure. In the case of this house, those areas of the cladding that are currently performing will require careful ongoing maintenance to ensure they continue to perform for the life of the building, such areas include:

- the clerestory/oblique eave junction
- junctions that rely on sealant and similar
- maintaining open drainage holes to the cladding
- corroding roof screws
- lichen growth that could damage the paint coating.

6.3.3 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 Ministry 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 2007/060<sup>13</sup>).

## **6.4 Compliance with the remaining clauses of the Building Code**

### **Clause E3 Internal Moisture**

6.4.1 I accept the expert's opinion in regard to the bathroom tiling. The satisfactory inspections during construction and the lack of apparent problems after more than 15 years provide reasonable grounds to allow me to conclude that shower tiling complies with Clause E3.

<sup>13</sup> Determination 2007/060 Regarding a code compliance certificate for a house with monolithic and weatherboard cladding systems (11 June 2007).

### **Clause F4 Safety from falling**

6.4.2 Taking account of the expert's report, I accept that most of the areas identified by the authority have now been satisfactorily addressed. However, the gaps greater than 100mm below the bottom rails of the glazed balustrades still require attention.

### **Clause F7 Warning systems**

6.4.3 I note the authority and the expert have also identified the lack of operating smoke alarms in some areas. However, the provision of domestic smoke detectors in the Acceptable Solution for Clause F7 Warning systems, F7/AS1, did not come into effect until April 2003. The consent was issued in February 2002 and subsequent changes to the Building Code (and any associated changes to the relevant Acceptable Solutions) cannot be enforced retrospectively. However, irrespective of this I strongly suggest that the smoke detectors be installed to meet the current standards.

6.4.4 Taking account of the expert's investigations and the other evidence, I am satisfied that the building work complies with the remaining Building Code clauses identified by the authority, namely Clauses B1, E3, G11, G12 (refer paragraphs 0 and 6.4.1).

## **6.5 The compliance matters identified in the section 95A notice**

6.5.1 Taking account of the expert's report and the other evidence, Table 1 summarises my conclusions on items identified by the authority (see Figure 1 for locations).

**Table 1: The authority's section 95A refusal**

s95A notice dated 1 February 2018 (in summary)		Expert's and architect's comments (in summary)		Compliance	Para ref.
<b>1</b>	<b>Cladding and joinery</b>				
a)	Blocked drainage openings to EIFS		<ul style="list-style-type: none"> <li>• Drainage openings restored</li> </ul>	Compliant	5.5.1
		<b>B3</b>	<ul style="list-style-type: none"> <li>• Laundry soffit area lacks cavity drainage from cladding above</li> <li>• No indication of moisture ingress, but presence of ants noted</li> </ul>	<b>Work required</b>	6.2.4
b)	Cladding clearances		<ul style="list-style-type: none"> <li>• Generally remediated</li> </ul>	Compliant	5.7
		<b>D1</b>	<ul style="list-style-type: none"> <li>• No clearance at garage door jambs</li> </ul>	<b>Work required</b>	5.7
c)	Missing parapet cappings	<b>A7</b>	<ul style="list-style-type: none"> <li>• Metal cappings installed to most parapets</li> <li>• Remaining junctions well sealed</li> </ul>	Compliant	6.3.26. 3.2
d)	Unsealed construction penetrations		<ul style="list-style-type: none"> <li>• All penetrations appear well sealed</li> </ul>	Compliant	5.1.2
e)	Unsealed post-construction penetrations				
f)	Adequacy of flashings not confirmed		<ul style="list-style-type: none"> <li>• Inspected during construction</li> <li>• Generally appear satisfactory</li> </ul>	Compliant	5.1.2
		<b>A3</b>	<ul style="list-style-type: none"> <li>• Leaking stop end to apron at north-east corner of upper guest bedroom</li> </ul>	<b>Work required</b>	5.3
g)	Lack of access to assess upper cladding areas		<ul style="list-style-type: none"> <li>• Upper cladding not inspected in full</li> </ul>	<b>Further investigation required</b>	5.1.2



s95A notice dated 1 February 2018 (in summary)		Expert's and architect's comments (in summary)		Compliance	Para ref.
<b>2</b>	<b>Decks and Barriers</b>				
a)	Missing barriers		<ul style="list-style-type: none"> <li>Exterior timber balustrades installed since final inspection</li> </ul>	Compliant	
b)	Lack of access to assess deck membrane	<b>C1</b> <b>C2</b> <b>C3</b>	<ul style="list-style-type: none"> <li>Inspected during construction</li> <li>High moisture readings recorded at deck junctions and at balusters</li> </ul>	<b>Further investigation required</b>	5.3 6.2.4
c)	Inadequate barriers		<ul style="list-style-type: none"> <li>Now remedied</li> <li>No structural issues noted</li> </ul>	Compliant	
d)	Inadequate barrier heights		<ul style="list-style-type: none"> <li>Now remedied</li> </ul>	Compliant	
e), f)	Inadequate deck falls and thresholds	<b>C1</b> <b>C2</b> <b>C3</b>	<ul style="list-style-type: none"> <li>Falls and thresholds approved for consent</li> <li>Inspected during construction</li> <li>Deck slopes 0.6° to 0.8°</li> <li>Deck thresholds are close to 50mm</li> </ul>	<b>Further investigation required</b>	5.3 6.2.4
g)	Top fixed membrane penetrations	<b>C7</b> <b>C8</b>	<ul style="list-style-type: none"> <li>Approved in consent docs</li> <li>Inspected during construction</li> <li>Leaks beneath some balusters</li> </ul>		
<b>3</b>	<b>Internal</b>				
a)	Cracks in the plaster board finish		<ul style="list-style-type: none"> <li>Cosmetic only</li> </ul>	Compliant	
b)	Cracks in the concrete floor slab		<ul style="list-style-type: none"> <li>Cosmetic only</li> </ul>	Compliant	
c)	Cylinder straps to be installed where required		<ul style="list-style-type: none"> <li>Now installed</li> </ul>	Compliant	
d)	Effervescent salts in floor slab at edge location		<ul style="list-style-type: none"> <li>Cosmetic only – now cleaned off</li> <li>Issue now not visible</li> </ul>	Compliant	
e)	Elevated non-invasive moisture readings	<b>A3</b> <b>C9</b> <b>C8</b> <b>C7</b> <b>B2</b> <b>A7</b>	<ul style="list-style-type: none"> <li>High moisture levels to timber framing in some areas</li> </ul>	<b>Further investigation required</b>	5.3 5.6.1
f)	Fixed climb points at barrier locations		<ul style="list-style-type: none"> <li>Fixed shelving has been removed from in front of the barrier</li> </ul>	Compliant	5.8.1
g)	Gas cylinder located in kitchen cupboard		<ul style="list-style-type: none"> <li>Relocated to outside dwelling</li> </ul>	Compliant	0
h)	Membrane performance		(Presumed applies to bathrooms) <ul style="list-style-type: none"> <li>No evidence of failure observed after 15 years</li> </ul>	Compliant	0

s95A notice dated 1 February 2018 (in summary)		Expert's and architect's comments (in summary)		Compliance	Para ref.
i)	Office not inspected at owner's request		<ul style="list-style-type: none"> <li>Inspected and no non-compliances noted</li> </ul>	Compliant	
j)	Openings greater than 100mm in the open risers		<ul style="list-style-type: none"> <li>Most openings reduced</li> <li>Slats installed between risers</li> <li>Openings below stair balustrade still too large</li> </ul>	<b>Work required</b>	6.4.2
k)	Remediation of the jamb liner, plaster board, stopping and trims		<ul style="list-style-type: none"> <li>Item not able to be identified</li> </ul>	-	5.5.1
l)	Signs of movement in the aluminium joinery and or misalignment of the openings		<ul style="list-style-type: none"> <li>Remedied</li> <li>No defect now evident</li> </ul>	Compliant	5.5.1
m)	Smoke alarms are to be installed and tested where required		<ul style="list-style-type: none"> <li>Smoke alarms installed</li> <li>No alarms near office or meeting room – could be used for sleeping</li> </ul>	Not required by Building Code at time building consent was issued	6.4.3
n)	Swollen jamb liner (suspect moisture related)		<ul style="list-style-type: none"> <li>Item not able to be identified</li> </ul>	-	5.5.1
<b>4</b>	<b>Other</b>				
a)	Ground levels recently lowered	<b>D2</b>	<ul style="list-style-type: none"> <li>Levels reduced to comply</li> </ul>	Compliant	5.7.1
		<b>D3</b>	<ul style="list-style-type: none"> <li>Limited clearance adjacent garage door jambs</li> </ul>	<b>Work required</b>	
b)	Inadequate floor clearances	<b>C1</b> <b>C2</b> <b>C3</b>	<ul style="list-style-type: none"> <li>Some levels reduced to comply</li> <li>Deck clearances minimal</li> </ul>	<b>Further investigation required</b>	5.6.1
c)	Stair riser openings too large		<ul style="list-style-type: none"> <li>Most openings reduced</li> <li>Some openings still over 100mm</li> </ul>	<b>Work required</b>	5.8.1
<b>5</b>	<b>Roof</b>				
a)	Lack of spreaders to downpipes		<ul style="list-style-type: none"> <li>Spreaders now installed</li> </ul>	Compliant	5.4.1
b)	Lack of access to assess roof		<ul style="list-style-type: none"> <li>Screw fixed with high wind restraints</li> <li>Some corroding screws</li> <li>Lichen growth</li> </ul>	Compliant, maintenance items	5.4.1 6.3.2

## 7. What happens next?

- 7.1 I note that the building consent was issued to the current owner of the house, and a notice to fix is therefore able to be issued in respect of breaches of the Act in respect of 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 6.2.4 and 6.4.2; and refer to any further defects that might be discovered in the course of investigation and rectification. However, the notice should not specify how those defects are to be fixed because that is a matter for the applicant to propose and for the authority to accept or reject.
- 7.2 If the applicant still wishes to seek a code compliance certificate for the house, 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 and should address the areas identified in paragraph 7.1; including appropriate investigation and timber sample testing to determine the treatment level and the extent of hidden damage to the timber framing.
- 7.3 A code compliance certificate will be able to be issued once these matters have been rectified to the authority's satisfaction and the durability modification is resolved.

## 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 original building consent was issued in 2002:
- the exterior building envelope does not comply with Clauses E2 and B2
  - the stair balustrades do not comply with Clause F4
- 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 31 May 2019.

Katie Gordon  
**Manager Determinations**