MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HIKINA WHAKATUTUKI

Determination 2017/046

The refusal to issue a code compliance certificate for a 15-year-old house with EIFS cladding completed under the supervision of a building certifier at 130C Ireland Road, Mount Wellington, Auckland

Summary

This determination is concerned with the compliance of the building envelope to a 15-year-old house. The determination considers the authority's reasons for refusing to issue the code compliance certificate and whether the house complies with the requirements of 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[1] ("the Act") made under due authorisation by me, John Gardiner, Manager Determinations and Assurance, 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 building, R and S Gwyn ("the applicants")
- the Auckland 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 15-year-old house. The refusal arose because the authority is not satisfied that building work complies with certain clauses[2] of the

[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 or by contacting the Ministry on 0800 242 243.
[2] In this determination, references to clauses are to clauses of the Building Code and references to sections are to sections of the Act.

Building Code (First Schedule, Building Regulations 1992). The authority's concerns relate to the weathertightness and durability of the cladding.

1.4 The building work had been undertaken under the supervision of Approved Building Certifiers ("the building certifier"), which was duly registered as a building certifier under the Building Act 1991 ("the former Act"), but which ceased operating as a certifier before it had issued a code compliance certificate for the house.

1.5 The matter to be determined[3] is therefore whether the authority was correct to refuse to issue a code compliance certificate for the reasons given in its letter dated 5 May 2016 (see paragraph 3.5). 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 original building consent was issued. The building envelope includes the components of the systems (such as the wall cladding, the windows, the decks and the roof cladding) as well as the way components have been installed and work together. This matter includes compliance with Clause B1 Structure, insofar as it applies to the weathertightness of the house.

1.6 Matters outside this determination

1.6.1 Building consent (No.AC/01/16429) dated 27 November 2001 was issued for the following building work:

- Unit 1: 130C Ireland Road on Lot 2 (the subject house – see paragraph 3.1.3)
- Unit 2: 130B Ireland Road on Lot 3.

1.6.2 I note that the authority's refusal to issue a code compliance certificate for Unit 1 requires the owners to apply to the authority to divide the original building consent into two separate consents, and I leave this matter to the parties to resolve in due course. This determination anticipates the issue of separate consents and is therefore limited to considering the code compliance of Unit 1.

1.6.3 I also note that the owners will be able to 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 Unit 1 in 2002. Although I leave this matter to the parties to resolve in due course, I have taken the anticipated modification into account when considering the claddings.

1.7 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.

2. The building work

2.1 The building work consists of a detached house that steps down a steeply sloping harbour side site in a medium wind zone for the purposes of NZS 3604[4]. The house is two-storeys high with a single-storey attached garage at the western high point of the site. The house is fairly complex in plan and form and is assessed as having a high weathertightness risk.

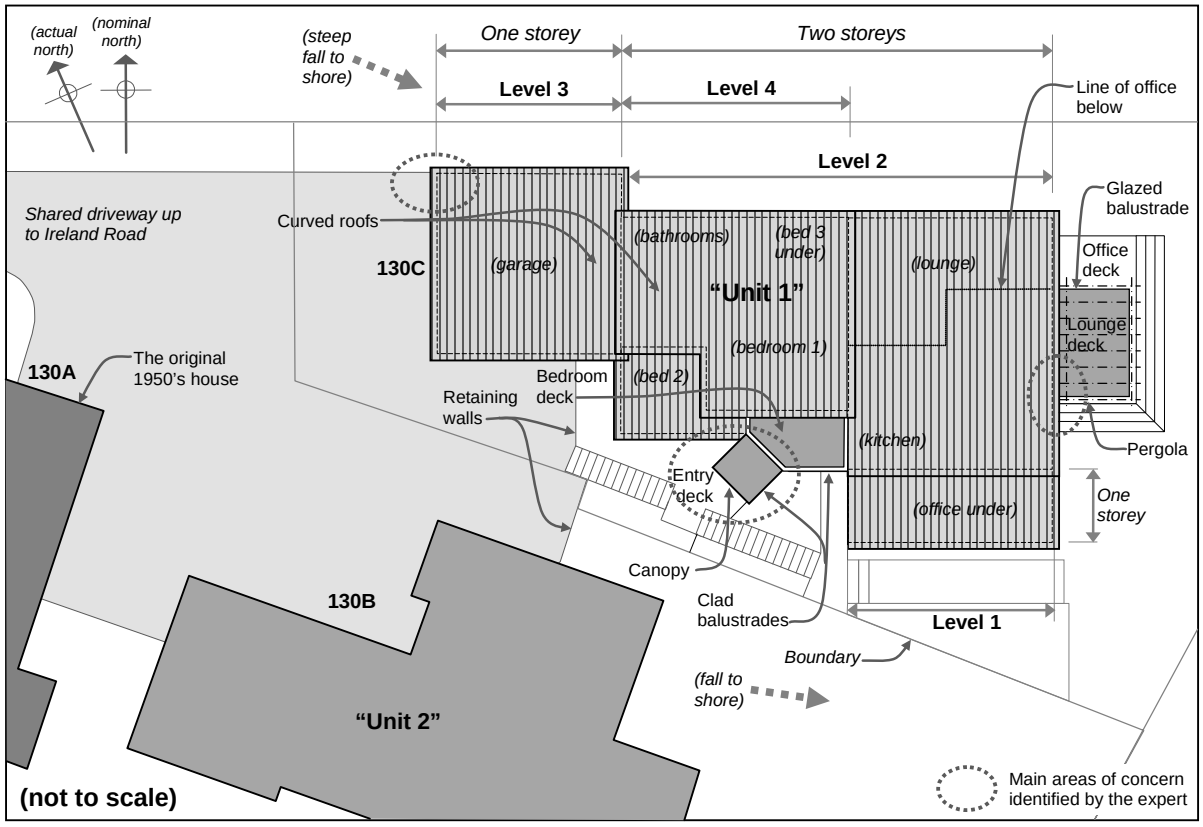
[3] Under sections 177(1)(b) and 177(2)(d) of the Act
[4] New Zealand Standard NZS 3604:1999 Timber Framed Buildings

2.2 Construction is a mix of specific design and conventional light timber frame; with specifically engineered timber pile foundations, multi-level timber framed floors, monolithic wall cladding, aluminium windows and corrugated metal roofing. The curved roofs are set at various levels, with lean-tos from south walls and roof overhangs of about 100mm to 200mm overall.

2.3 As shown in Figure 1, Unit 1 accommodates the following:

- Level 1 (the lower level): an office and toilet, with doors opening onto a ground level deck ("the office deck") to the east.
- Level 2 (the mid level): the entry foyer, entry deck and entry canopy, two bedrooms and bathroom, and the lounge/dining/kitchen area opening onto a deck ("the lounge deck") to the east.
- Level 3 (the garage): a single-storey garage, with stair access to Levels 2 and 3
- Level 4 (the upper level): the master bedroom and ensuite, with a small deck opening off the bedroom south wall ("the bedroom deck).

Figure 1: Approximate site plan (not to scale)



2.4 The decks

2.4.1 The house includes two attached timber slat decks; an entry deck at Level 2 and the office deck at Level 1. The entry deck includes framed and clad balustrades, with additional clad balustrades at retaining walls and exterior stairs. The office deck includes steps down to ground level, with a balustrade to the north end only.

2.4.2 The house also includes three enclosed decks with butyl membrane floors overlaid with floating timber slats as follows:

- The Level 2 lounge deck is supported by metal posts that extend to support a metal pergola and has a metal-framed glass balustrade fixed to the deck edge.
- The Level 2 entry deck appears[5] to have EIFS[6]-clad balustrades.
- The Level 4 bedroom deck has EIFS-clad balustrades and is constructed above the entry foyer.

2.5 The expert forwarded four samples of moisture-damaged timber for testing. The laboratory confirmed that the three samples extracted from bottom plates were 'most likely perishable radiata pine', with the sample taken from a pile likely to be treated with CCA[7] to an equivalent of H4 or H5[8]. Taking account of the evidence and the date of construction in 2002, I consider that the exterior wall framing is not treated.

2.6 The wall cladding

2.6.1 The cladding system is a form of monolithic cladding system known as EIFS. In this instance, the proprietary system consists of polystyrene backing sheets fixed directly through the building wrap to the framing and finished with a mesh reinforced plaster system. The system includes purpose-made flashings to windows, edges and other junctions.

2.6.2 The inside face of the polystyrene backing sheets is indented by a diamond pattern of grooves at 50mm centres. Grooves are approximately 15mm deep by 15mm wide and are intended to facilitate drainage via the rear face to provide additional protection against the consequences of moisture ingress.

3. Background

3.1 The consent

3.1.1 The building certifier issued a building certificate for the consent documents on 15 November 2001. The scope of engagement attached to the certificate recorded no exclusions except for electricity and included the issue of a code compliance certificate for Unit 1 and Unit 2.

3.1.2 Based on the building certificate, the authority issued the building consent (No. AC/01/16429) on 27 November 2001 for '2 new dwellings' under the Building Act 1991 ("the former Act").

3.1.3 According to the applicants, the subject house was completed prior to the second unit. I note that the building certifier's records note preline inspections approved for Unit 1 in May 2002, while preline inspections for Unit 2 were not approved until October 2002. On that basis, I have taken the subject house to be Unit 1 and the adjacent house at 130B as Unit 2.

[5] Based on photograph 35 in the expert's report, deck floor appears to be timber over membrane with clad balustrades
[6] Exterior Insulation and Finish System
[7] CCA - Chromated copper arsenate
[8] Treatment to Hazard class H4 and H5 is for timber used for in ground contact; H5 is for timber piles.

3.2 The construction

3.2.1 Construction commenced on driving the pile foundations, but problems arose due to a layer of sandstone and the engineer changed the design for Unit 1 to bored and concreted 150mm diameter piles. The engineer issued revised foundation bracing calculations dated 13 March 2002 and confirmed the satisfactory inspection of the bore holes in a letter to the applicant dated 18 March 2002.

3.2.2 The building certifier's 'Job Report' dated 1 March 2004 indicated that inspections carried out and approved during construction of Unit 1 included:

- preline building and plumbing on 10 and 15 May 2002
- drainage on 26 June 2002.

3.2.3 Based on the above dates of preline inspections, it appears that the exterior claddings would have been installed prior to May 2002 and Unit 1 would have been substantially completed by the end of June 2002. (I note that at this time, the building certifier's scope of approval included inspection of the EIFS cladding.)

3.2.4 According to the applicants, final inspections of Unit 1 were approved on 26 June 2002 and they were advised that an interim code compliance certificate had been issued because it was not possible to issue a final code compliance certificate until Unit 2 was completed. However, the building certifier's reports do not include any final inspections and I have not seen a copy of any interim code compliance certificate issued during 2002.

3.2.5 Unit 2 was subsequently completed by the end of 2003, with final inspections recorded as approved on 27 February 2004. However, before these were carried out, the building certifier's scope of approval was amended to exclude wall claddings outside of E2/AS1, and the certifier issued an interim code compliance certificate for the building consent on 27 February 2004 under Section 55 of the former Act.

3.2.6 The building certifier informed the applicants that it could not issue a final code compliance certificate and the authority would be required to inspect the cladding. The certifier's approval as a building certifier expired on 6 September 2004.

3.3 The 2006 final inspections

3.3.1 The authority carried out a final inspection on 8 November 2006 after being contacted by the applicants. The authority's inspection noted several areas where it did not believe the building work complied with the Building Code Clauses E1, E2, F2, F4 and G12. Following remedial work, the applicants applied for a code compliance certificate on 11 December 2006.

3.3.2 The authority re-inspected the house on 11 December 2006, passing items identified during its previous inspection. The authority did not inspect the exterior envelope, with the checklist noting that the 'weathertightness team [was] to confirm exterior'. However, the authority did not carry out a weathertightness inspection and did not respond to the applicants' application for a code compliance certificate.

3.4 The 2009 final inspection

3.4.1 The applicants contacted the authority in 2009 and were informed that another final inspection would be required. On 14 December 2009, the authority carried out a further final inspection and its checklist identified various failed items, including:

- decks and balconies: step down, outlet drain size and overflow drain, the waterproof membrane, deck slope and balustrade
- extract fans vented to exterior in the kitchen, bathroom and ensuite
- cladding clearances from ground level.

3.4.2 A site meeting held on 30 March 2010 to 'inspect non-compliant issues' noted:

1) Hand rails to all stair/steps
2) Back flow prevention to shower hoses
3) Vents changed to flap type
4) Smoke alarm installed to lower level rumpus/office
5) Wall sealed behind tiles.

Note: Exterior deck plywood no membrane and small outlet (Deck's not large) easy to replace if required and not over habitable area.

Ground clearance achieved to cladding, scoria below cladding system.

Peer review required for cladding system & decks.

Need to see if these two properties can be separated from the one consent.

3.5 The 2016 final inspection

3.5.1 I have seen no evidence of further correspondence until 2016, when the applicants contacted the authority to confirm that a code compliance certificate had been issued and were told that a further inspection would be required.

3.5.2 The authority inspected Unit 1 on 27 April 2016 (I do not appear to have received a copy of this inspection). Attached to its response to the draft determination (refer paragraph 4.6), the authority provided copies of photographs taken during this inspection. These photographs are undated and do not describe their locations within Unit 1, but they generally show:

- interior re-decoration, and timber and paint materials stored in garage
- rusted carpet fixings, cracks in timber joinery reveals
- swelling of timber trim
- plasterboard/trim junction cracks
- non-invasive moisture readings ranging from 12% to over 40%.

3.5.3 The applicants have commented that the above photographs had been taken during April 2016; as they show maintenance work underway when tenants had vacated the house. Linings were subsequently removed from each location identified in the photographs, allowing framing to be exposed for the building surveyor's assessment. The applicants noted that the expert's report shows those areas of exposed framing.

3.6 The refusal to issue a code compliance certificate

3.6.1 The authority wrote to the applicants on 5 May 2016 to advise that a code compliance certificate could not be issued because it could not be 'satisfied on reasonable grounds' that building works comply with the Building Code. The authority recommended that:

> ... you engage the services of a suitably qualified individual (Building Surveyor) who is qualified in Weather Tight assessment and Remedial Design.
>
> This person must further investigate the performance of this building, also taking into account the items below and provide a 'scope of works' and any recommendations to Council for further review.

3.6.2 The authority listed areas of concern, which were 'not limited to' the following:

1. Elevated non-invasive moisture readings have been identified.
2. Insufficient detailing to the approved plans.
3. Non-compliance of the New Zealand Building Code has been sighted during the final inspection.
4. Missing inspections and inspection records.
5. Potential moisture ingress and early signs of decay have been sighted in areas.
6. Potential remediation of the cladding has been sighted in areas.
7. Remediation of the bathroom identified by the Owner.
8. Roof and cladding at height not inspected due to access i.e. health and safety.
9. Separation of consent to be applied for i.e. 130B has been inspected.
10. Subfloor inspection not completed in full due to access.
11. Various changes from the approved plans have been sighted.
12. Various concerns regarding Code Clauses B1, B2, E2, E3, F4 & F7 have been sighted.

3.7 The building surveyor's report

3.7.1 The applicants subsequently engaged a building surveyor to inspect the house and respond to the items identified by the authority. As part of their response to the draft determination, the applicants provided the Ministry with a copy of the building surveyor's report dated 31 October 2016. The report notes that the building surveyor reviewed the property file and inspected the house in early September 2016 and provided the following comments [9] (items noted are from the authority's letter dated 5 May 2016):

3.7.2 In regard to elevated moisture readings (Item 1)

- cut-outs through the EIFS were made to investigate the underlying framing
- invasive moisture testing into framing varied from about 12% to 21%
- although testing followed a wet winter, the highest reading was 21% beside the lower south bifold (likely due to a blocked drain hole or a failed joinery mitre).

3.7.3 In regard to observed non-compliance (Item 3):

- the non-compliance is assumed to refer to entry area and garage door area, repairs are recommended for both areas.

[9] I have not included comment made against those items that do not relate to the test for compliance under section 436 of the Act.

3.7.4 In regard to potential cladding repair work (Item 6):

- the repairs apparently followed accidental mechanical damage.

3.7.5 In regard to bathroom remediation (Item 7):

- the original shower was replaced with shower over a tub
- the change involved no plumbing alterations and the wall was waterproofed and tiled as part of the work, there is no evidence of failure.

3.7.6 In regard to lack of roof access (Item 8):

- it would be prudent to add kick-out diverters to the bottom of apron flashing.

3.7.7 In regard to subfloor investigation (Item 10):

- all areas were dry and well ventilated
- the engineer was present during subfloor construction.

3.7.8 In regard to Clauses B1, B2, E1, E2, F4, F7 (Item 12):

- handrails, restrictor stays, and smoke alarms to be fitted (Clauses F4 and F7).

3.7.9 The report recommended the following repairs:

a) Left of garage door to be repaired.

b) Area around front door to be replaced...

c) Turnouts to end of apron flashings.

d) Cladding to be repaired and repainted where investigated.

e) Lower joinery mitre to be resealed, a flat flashing could also be placed to provide a direct drainage path to bottom of boundary.

f) Base of cladding over curved roof areas to be repaired.

g) Repair cladding cuts appropriately.

3.8 The site meeting

3.8.1 A site meeting subsequently took place on 29 November 2016 and, in an email to the applicants dated 9 January 2017, the authority identified the following items as 'requiring further investigation to clarify compliance':

1. Discoloration to structure at south elevation to be clarified
2. Discoloration to structural foundations
3. Deterioration of galvanised structural beams
4. Deterioration of structural connections
5. Invasive investigation at west elevation ground floor entry appears incomplete in relation to the concerns seen at this location i.e. cladding clearance is non [compliant], cladding remediation evident, face fixed [membrane] sill flashing with penetrations etc
6. Invasive investigation to deck thresholds to be completed due to concerns identified within this email i.e. items 1 & 8
7. Subfloor bracing is non-compliant in areas
8. Water staining to underside of deck ply, lack of nogs, discoloration to joists etc. On the 30th of March 2010 it was identified that the membranes to the ply substrates on the 2001 consent has not yet been installed.

3.9 The Ministry received an application for a determination on 17 January 2017.

4. The submissions

4.1 The applicants provided a 'Summary of events' and a submission clarifying and setting out their views on those events, which had culminated in a weathertightness assessment of the EIFS by a building surveyor. That investigation had involved 'invasive external and internal testing in all potential problem areas', which had apparently found no evidence:

> ...to suggest the cladding wasn't performing for what was now a 14 year old home, although two unrelated issues [of] water ingress were identified and included in the report, with suggestions to remedy.

4.2 The applicant stated that they had since been advised that 'a determination is likely required to see the [code compliance certificate] issued', noting:

> Since the report, a further inspection between [the authority] and the Building Surveyor took place in November 2016 and we have subsequently in January 2017 received further reasons from [the authority] to avoid issuing the [code compliance certificate].

4.3 The applicants provided copies of:

- the consent drawings and specification
- the original building consent for Units 1 and 2 dated 27 November 2001
- the design engineer's letter to the applicant dated 18 March 2002
- the building certifier's building certificates, inspection records and reports
- the interim code compliance certificate dated 27 February 2004
- the authority's final inspection and site meeting records
- the authority's refusal to issue a code compliance certificate dated 5 May 2016
- various calculations, producer statements, certificates and other information.

4.4 The authority acknowledged the submission, but made no submission in response.

4.5 A draft determination was issued to the parties for comment on 20 April 2017.

4.6 The authority accepted the draft on 5 May 2017, but noted that the lack of evidence of interior moisture described by the expert (see paragraph 5.3.1) may have been because any signs were hidden by interior repainting carried out during 2016. The authority attached photographs it had taken during a 2016 site visit, which it contended indicated evidence of moisture ingress.

4.7 The applicants accepted the draft determination on 3 and 5 May 2017, subject to 'non-contentious amendments' noted on the draft. I have reviewed those comments and amended the draft as I consider appropriate. I note that some very detailed questions about Table 1 go beyond the scope of the expert's investigations and do not affect conclusions reached in this determination as to code compliance. The applicants also provided a copy of the building surveyor's report dated 31 October 2016, a summary of which I have included in this determination (see paragraph 3.7).

4.8 I have taken the parties comments into account and amended the determination as appropriate.

5. The expert's report

5.1 General

5.2 As mentioned in paragraph 1.6.3, I engaged an independent expert to assist me. The expert is a member of the New Zealand Institute of Architects and inspected the house on 9 February 2017. The expert's report was received on 14 March 2017, and was sent to the parties on the same day.

5.2.1 The expert noted that the scope of his inspection was to provide an opinion about items identified in the authority's section 95A refusal to issue a code compliance certificate dated 25 November 2015 and to assess the areas identified by the authority in regard to their code compliance with the associated parts of Clauses B2 and E2.

5.2.2 The expert considered that the layout of the house was generally as indicated on the drawings except for the following changes:

- the EIFS cladding system used was different to that specified
- in regard to balustrades:
  - omission of timber balustrade to Level 1 office deck
  - metal and glass balustrade to Level 2 lounge deck in lieu of timber
  - EIFS-clad balustrade to Level 2 entry deck in lieu of timber
- minor changes to some window sizes and positions.

5.3 Moisture testing and sample analysis

5.3.1 The expert visually inspected internal linings to the external walls, noting these 'were generally free from mould, stains, swelling or other clear signs of moisture ingress.' The expert tested the linings using a non-invasive meter and the readings were inconsistent, generally low, but some elevated readings noted.

5.3.2 The expert also inspected sub-floor timber piles and framing and noted:

- corroded nail plates and fixings
- corrosion to bottom of a galvanised floor beam in contact with a timber pile
- black water stains to a timber pile beneath the office floor (Sample 1)
- water marks and decay beneath the entry deck.

5.3.3 The expert noted that cut-outs through the cladding and lining had been made during the building surveyor's inspection. The expert took 13 sample invasive moisture readings using long probes from the inside or into framing at existing cut-outs, with readings varying from 10% to 17% (see below and paragraph 5.3.7).

5.3.4 The expert's inspection was carried out in late summer and he noted that the surveyor's cut-outs had not been reclad, allowing for better ventilation to the framing over the summer months. He considered that the moisture content in framing 'is certain to be higher during winter months. (I note the applicants have advised that the readings generally aligned with the building surveyor's readings which were taken following a wet winter – see paragraph 3.7.2.)

5.3.5 The expert removed cladding and linings at some locations in addition to examining timbers exposed during the previous surveyor's inspection and noted:

- no visible signs of moisture or damage of framing to walls at:
  - balustrade/wall junction to Level 4 bedroom deck
  - below bedroom 2 roof/wall junction
  - below Level 4 master bedroom east window
  - below Level 1 jamb/sill junction to office south window
  - below Level 3 jamb/sill junction to garage north window
  - below Level 2 north east corner window to lounge.
- visible signs of moisture or decay to framing:
  - at the jamb/sill junction of the east office door (Sample 1)
  - at the north west corner of the garage (Sample 2)
  - below the internal gutter to the entry canopy/wall junction (Sample 4)
  - below the Level 4 master bedroom east window.

5.3.6 The expert forwarded samples from bottom plates and the pile for analysis and the laboratory report dated 19 February 2017 noted the following:

- The framing samples contained no detectable treatment and were 'most likely untreated perishable radiata pine'
- Sample 1 had been 'exposed to conditions close to those conducive to decay', with future or nearby decay likely, and contained:
  - 'dense fungal growths' but no structurally significant decay
  - yeasts and secondary moulds suggesting recent activity.
- Sample 2 contained:
  - 'well–established soft rot across much of the depth
  - structurally significant decay, with replacement likely to be required
  - traces of Stachybotrys mould.
- Sample 3 (the pile sample) was CCA-treated to H4 or H5 level and contained:
  - 'dense fungal growths' but no structurally significant decay
  - yeasts and secondary moulds suggesting recent activity.
- Sample 4 contained:
  - 'pockets of advanced brown rot across much of the depth'
  - structurally significant decay, with replacement likely to be required
  - traces of Stachybotrys mould.

5.3.7 The expert noted that the framing samples had moisture content readings of about 16%, which indicated that moisture levels 'must have been higher at various times since completion' in order to instigate fungal growth and develop decay. He therefore considered that other comparative readings do not by themselves indicate compliance with Clause E2.

5.4 The EIFS Cladding

5.4.1 The expert noted that the cladding system is not a product that satisfies E2/AS1, or has product appraisal or third party accreditation, and its assessment relies on in-history service. The cladding this year will have reached its durability period, and the question was whether it prevented moisture penetration during this time, rather than assessing only its current condition.

5.4.2 The expert made the following general comments on the EIFS cladding:

- despite lacking control joints, there were no significant cracks as a result
- except at the garage where clearances were reduced and at the junction of the cladding with the entry deck, base details were generally constructed in accordance with the manufacturer's instructions at the time
- the EIFS cladding extends down over subfloor framing and terminates sufficiently clear of the ground, with uPVC base mouldings visible at the bottom and floor levels typically more than 1m above ground level.

5.5 Joinery details

5.5.1 The expert observed that the windows and doors were recessed by the thickness of the cladding. The window installation appeared to accord with the cladding manufacturer's instructions, with metal head flashings, sealant visible at the jambs and sloping window sill reveals.

5.5.2 In order to assess the underlying construction, the expert reopened former cut-outs below the north east lounge window and at jamb/sill junctions to the garage north window and the office south window, observing:

- purpose-made pre-plastered polystyrene sills with a 25mm upstand
- no sill flashings in accord with the manufacturer's preference 'to use an aluminium flashing for window sills'
- building wrap and cladding clean and free from signs of moisture ingress, indicating reasonable evidence of adequate performance of the window installation detail.

5.5.3 Doors incorporated similar jamb and head details and the expert re-opened internal and external cut-outs beside the office deck door, observing that:

- the aluminium sill of the door unit sat above an infill strip of EIFS that lacked the 25mm upstand provided for window sills
- the door sill lacked sill flashings and the aluminium door sill did not extend under the jamb junction, with a gap at the jamb reveal that allows water to leak behind the cladding instead of draining out along a sill flashing
- there was water damage to plasterboard and stains to adjacent polystyrene, with dense fungal growths identified in the sample from the untreated bottom plate, indicating failure to comply with Clauses E2 and B2.

5.6 The roof flashings

5.6.1 The expert reopened cut-outs at three roof/wall junctions to assess the underlying construction, noting:

- standard metal flashings at roof/wall junctions
- building wrap and cladding clean and free from signs of moisture ingress, indicating reasonable evidence of adequate performance of the details.

5.6.2 The entry canopy soffit lining had been removed and the expert noted:

- evidence that the internal gutter above had leaked into the soffit, down the walls at the sides of the door and then down to the particle board flooring and floor framing, which were all water stained
- the sample taken from beside the entry door contained 'pockets of advanced brown rot across much of the depth', indicating failure to comply with Clauses E2 and B2 with similar damage likely to other framing subject to the leak.

5.7 The decks

5.7.1 At the Level 4 bedroom deck, the expert reopened external and internal cut-outs at the balustrade/wall junctions and observed:

- flat-topped parapet cappings installed to the top of the EIFS-clad balustrade and sealed to the wall cladding
- low moisture content readings, with building wrap and cladding clean and free from signs of moisture ingress, which indicated reasonable evidence of adequate performance of the junction details.

5.7.2 At the Level 2 lounge deck, the expert noted that:

- the deck membrane had been overlaid with open slat boards in 2016, which had reduced the height of the glazed balustrade to 965mm above the new surface
- water was visible on the face of the cladding below the deck floor/wall junction, likely due to a defect in the membrane above
- the leak had followed light rain and the soffit lining was likely to be holding water that could be absorbed into the deck framing and could also be contributing to the moisture damage beside the office deck door below
- deck joist hangers are nailed through 12mm thick plaster into the stringer, which does not satisfy the requirements of NZS3604 for direct fixing.

5.8 The authority's list of concerns

5.8.1 The expert also assessed the lists of concerns identified by the authority and Table 1 summarises the expert's responses. Shaded cells relate to items where either:

- the authority has provided insufficient information or clarification for the expert to be able to comment or assess compliance, or
- concerns are matters for the parties to resolve, or
- concerns are considered to be fairly minor and insufficient reasons in themselves for the authority to refuse to issue a code compliance certificate.

Table 1: The authority's concerns

Areas of concern in the section 95A refusals (in summary)		Expert's comments	Compliance (see paragraph 7.3.4 for detail)	Refer para.
Letter of 5 May 2016				
1	Elevated moisture	• evidence of moisture penetration/ damage to some areas	Investigation/ repairs required	5.3
2	Lack of detailing in approved drawings	• authority issued building consent on drawings, based on certificate • insufficient reason in isolation to refuse code compliance certificate		
3	Items from 2009 final inspection	• items identified relate to compliance with Acceptable Solutions, not performance requirements of Building Code • deck performance now assessed • cladding clearance now assessed	Investigation/ repairs required	5.7 5.4.2
4	Missing inspections/records	no identification of what further inspections are required to reach conclusion on code compliance		
5	Signs of leaking and decay	• evidence of moisture penetration and damage to some areas	Investigation/ repairs required	5.3
6	Unapproved cladding repairs	• no identification of what area is referred to • applicants believe area is Level 2 entry, where new decking was laid (see item 5 below) • no access to inspect entry deck sub-floor	Insufficient information to access compliance	
7	Bathroom repairs	• insufficient reason in isolation to refuse code compliance certificate • no identification of what bathroom items do not comply	Insufficient information to access compliance	
8	Lack of access to inspect roofing	• lower level roof inspected • ceilings inspected – no evidence of failure to perform • roof cladding has performed for almost 15 years	Adequate	0
9	Separation of consent from Unit 2	processing matter for authority and owners		
10	Lack of access to inspect sub-floor	• unable to access subfloor to garage and entry deck • all other subfloor areas accessible	Some repairs required to sub-floor	5.3.2
11	Changes from approved plans	• changes relatively minor • insufficient reason in isolation to refuse code compliance certificate		
12	Concerns regarding Clauses B1, B2, E1, E2, E3, F4 and F7	• inspection report covers B1, B2, E2 and F4 • other concerns not identified by authority • no obvious evidence of failure re E1 and E3 • smoke alarms not checked re F7		
Email of 5 May 2016				
1	Stained structure on south elevation	• no identification of what part of structure • if referring to steel posts to lounge deck, then maintenance is required • surface finishes beyond required durability	Insufficient information to access compliance	

Areas of concern in the section 95A refusals (in summary)		Expert's comments	Compliance (see paragraph 7.3.4 for detail)	Refer para.
2	Stained foundations	• blackening of some timber piles • testing carried out • CCA treatment and lack of decay indicates satisfactory performance	Adequate	5.3.6
3	Deteriorating beams	• corrosion noted at beam/ pile junction	Structural assessment required	5.3.2
4	Deteriorating connections	• some corroding nail plates and wire dogs • corrosion more severe than usual for subfloors • unlikely to comply with B1 and B2	Investigation/ repairs required	5.3.2
5	Incomplete investigation of entry area	• damage mainly due to gutter leak • other issues can be investigated in future remediation proposal for entry area (including entry deck)	Investigation/ repairs required	5.6.2
6	Incomplete investigation of deck thresholds re items 1 and 8	• office deck door threshold leaking, with damaged timber • all similar door thresholds need investigation	Investigation/ repairs required	5.5.3
7	Non-compliant subfloor bracing	• no identification of what is missing or considered to be non-compliant	Insufficient information to access compliance	
8	Water staining to deck ply, joists, membrane etc	• no identification of what deck is referred to • applicants believe it to be Level 2 lounge deck, which is not over a habitable space • lounge deck has membrane although that was not shown in consent drawings • deck joists accord with consent drawings, with nogs not required at the time of construction • leaks below lounge deck included in report	Investigation/ repairs required to leak	5.7.2

5.9 Summary

5.9.1 The expert considered that the following areas required attention in order to comply with Clauses B1, E2 and B2 (with the associated clauses shown in brackets):

- door sills to Level 1 office deck and other doors with similar details (E2)
- the internal gutter to the Level 2 south entrance canopy, with moisture penetration and damage to timber framing below (E2)
- the lack of cladding clearances at garage walls, with moisture penetration and damage to timber bottom plates (E2)
- the leak to the deck floor/wall junction of the Level 2 lounge deck (E2)
- corrosion to galvanised wire dogs, nail plates and other structural connections in subfloor space, and replacement with stainless steel likely needed (B1, B2)
- corrosion of the subfloor steel beam in contact with the top of a pile (B1, B2)
- the 13 cladding cut-outs, which require weatherproofing (E2)
- the lack of documentation to cover the Level 2 lounge deck balustrades, including their connection to the deck structure (B1).

5.9.2 The expert concluded that:

> The decision of the [authority] not to issue a [code compliance certificate] appears to be correct because some of the construction does not comply with the requirements of the [Building Code]. However, the cut-outs viewed during this investigation provide evidence that the cladding system has performed adequately, subject to the discrete areas of failure noted. That is, there has not been a systemic failure of the cladding.

6. Compliance generally

6.1 I note that 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'.

6.2 I anticipate the division of the original building consent to provide a separate consent for Unit 1 and I leave this matter to the parties to resolve (see paragraph 1.6.1). In order to determine whether the authority correctly exercised its power of decision in refusing to issue a code compliance certificate, I must therefore consider whether Unit 1 complies with the provisions of the Building Code that applied when the consent was issued in 2000.

6.3 In order for me to form a view on the code compliance of this house, I established what evidence was available and what could be obtained considering that the building work is completed and some of the elements are not able to be cost-effectively inspected.

6.4 In the absence of any evidence to the contrary, I take the view that I am entitled to rely on the building certifier's inspection records, although I note that these are very limited in detail. I therefore consider it important to look for evidence that corroborates these records to verify that the building certifier's inspections were properly carried out. In this particular case, corroboration comes from the assessment of accessible components by the expert, which can be used to verify whether the building certifier's inspections were properly conducted.

6.5 In summary, I find that the following evidence will allow me to form a view as to the code compliance of the Unit 1 as a whole:

- the confirmation of foundation inspection by the engineer
- the record of inspections carried out by the building certifier, which indicates satisfactory inspections of the inaccessible components
- drawings, calculations, producer statements, and other technical information
- the interim code compliance certificate
- the expert's assessment of the exterior building envelope.

7. Compliance with Clause E2 External moisture

7.1 The evaluation of building work 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 2004/1).

7.2 Weathertightness risk

7.2.1 Unit 1 has the following environmental and design features, which influence its weathertightness risk profile:

Increasing risk

- the house is two storeys high in part, with roofs at multiple levels
- the house has a deck with clad balustrades sited above an interior space
- the house has EIFS wall cladding fixed directly to the framing
- there are minimal roof overhangs to shelter the wall cladding
- the external wall framing is not treated to provide resistance to decay if it absorbs and retains moisture.

Decreasing risk

- the grooved back of the EIFS cladding provides some capacity for drainage.

7.2.2 Using the E2/AS1 risk matrix to evaluate these features, elevations are assessed as having a high weathertightness risk rating. If details shown in the current E2/AS1 were adopted to show code compliance, a drained cavity would be required for the EIFS cladding at all risk levels. However, this was not a requirement in 2002.

7.3 Weathertightness performance

7.3.1 The inspection records and the applicants' submission indicate that the building envelope was substantially complete before May 2002 (see paragraph 3.2.3) and I have taken that into account when considering the weathertightness performance as the wall and roof claddings are now more than 15 years old. The expert investigated the roof cladding and found its construction satisfactory.

7.3.2 Taking account of the expert's report, the EIFS wall cladding has generally been installed in accordance with the manufacturer's recommendations at the time and I concur with the expert's opinion that 'there has not been a systemic failure of the cladding', with problems apparently limited to discrete areas.

7.3.3 I accept the expert's comments on other areas identified by the authority (see Table 1) and also his comments regarding the adequacy in the circumstances of:

- the joinery construction of the windows
- the joints of the EIFS cladding
- the roof flashings.

7.3.4 I note the expert's conclusions in paragraph 5.9.1 and also his comments in paragraph 5.3.7 regarding damage to samples with currently low moisture levels; and I consider that the following areas of Unit 1 require attention:

- further investigation and sampling of the untreated bottom plates to determine the condition of timber likely to have suffered moisture penetration in the past

- investigation including establishing the extent of any timber damage, followed by appropriate repairs to:
    - the door sills to Level 1 office deck and other similar doors
    - the internal gutter to the Level 2 entrance canopy, including adjacent affected wall and deck areas
    - the deck floor/wall junction of the Level 2 lounge deck, including associated wall and soffit areas
    - the corroding structural connections in the subfloor space
    - the cladding clearances at garage walls
    - the cut-outs to the EIFS.

7.3.5 The parties should come to agreement on the appropriate level of further investigation, which I note can be carried out, for example, by drilling through skirtings or linings from the inside and taking drill samples for decay analysis.

7.4 Weathertightness conclusion

7.4.1 I consider the expert's report establishes that the current performance of the building envelope is not adequate because there is evidence of ongoing moisture penetration into some of the timber framing, with timber damage to at least three areas and I am therefore satisfied that the cladding does not comply with Clause E2 of the Building Code. Given the evidence of rot and fungal growth and the possibility of further undiscovered damage to the framing, I am also satisfied that some timber framing does not comply with Clause B1.

7.4.2 In addition, the house is required to comply with the durability requirements of Clause B2, which requires a building to satisfy all the objectives of the Building Code throughout its effective life. The durability requirements of Clause B2 include a requirement for wall claddings to remain weathertight for a minimum of 15 years and for timber framing to remain structurally adequate for a minimum of 50 years.

7.4.3 Although roof and wall claddings are now 15 years old, the expert's investigations indicate moisture ingress over an extended period. The evidence of current and past moisture penetration satisfies me that the EIFS cladding has not complied with Clause B2 insofar as it applies to Clause E2. Given the decay identified and the possibility of further undiscovered damage, I am also satisfied that the timber framing has not complied with Clause B2 insofar as it applies to Clause B1.

7.4.4 Because the identified moisture penetration and faults occur in discrete areas, I am able to conclude that satisfactory investigation and rectification of areas outlined in paragraph 7.3.4 will result in the external envelope being brought into compliance with Clauses B1, B2 and E2 of the Building Code.

7.4.5 With the exception of the Level 2 lounge deck balustrade, I consider that changes from the consent documentation outlined in 5.2.2 have not affected the compliance of the external envelope. In regard to the wall cladding, I note that the drawings call for the originally specified product 'or similar'. A minor variation under section 45A for these identified alterations from the consent documentation should be supplied to the authority and I leave this to the parties to resolve.

7.4.6 It is emphasised that each determination is conducted on a case-by-case basis. Accordingly, the fact that a particular EIFS cladding system has been established as being code compliant in relation to a particular building does not necessarily mean that the same cladding system will be code compliant in another situation.

7.5 Maintenance

7.5.1 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).

7.5.2 In the case of this particular house, I note the following:

- The house design includes a number of high risk features, which require careful consideration of maintenance requirements of the monolithic cladding in order to ensure its ongoing weathertightness.
- The external claddings appear to have been generally well-maintained, which I consider to be a key factor in the adequate weathertightness of the majority of the external building envelope over the past fifteen years.
- Although a modification of the durability provisions to allow the provisions to commence from the date of substantial completion in June 2002 means that the most of the claddings have remained weathertight for the required minimum 15 year period, the expected life of the building as a whole is considerably longer; and careful maintenance should continue to protect the underlying framing for its minimum required life of 50 years for the structure.

8. The durability considerations

8.1 The relevant provision of Clause B2 of the Building Code requires that building elements must, with only normal maintenance, continue to satisfy the performance requirements of the Building Code for certain periods ("durability periods") "from the time of issue of the applicable code compliance certificate" (Clause B2.3.1).

8.2 In this case the 15-year delay since substantial completion of Unit 1 in 2002 raises concerns that many elements of the building are now well through or beyond their required durability periods, and consequently may no longer comply with Clause B2 if a code compliance certificate were to be issued effective from today's date.

8.3 I have considered this in many previous determinations and I maintain the view that:

- the authority has the power to grant an appropriate modification of Clause B2 in respect of all the building elements, if requested by an owner
- it is reasonable to grant such a modification, with appropriate notification, as in practical terms the building is no different from what it would have been if a code compliance certificate for Unit 1 had been issued in 2002.

I therefore leave the matter of amending a separate building consent for Unit 1 to modify Clause B2.3.1 to the parties once matters addressed in this determination are satisfactorily resolved.

9. What happens next?

9.1 The authority may deal with this matter via a notice issued under section 95A of the Act. The notice should include the investigations and defects identified in paragraph 7.3.4; 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.

9.2 The applicant can then produce a response to the notice in the form of a detailed proposal to specifically address the matters of non-compliance and investigation for the areas identified, produced in conjunction with a competent person with suitable experience in weathertightness remediation, as to the investigation and rectification or otherwise of the specified matters. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

9.3 A code compliance certificate will be able to be issued once the above matters have been satisfactorily rectified and the original building consent has been amended to provide a separate consent for Unit 1; modified in regard to Clause B2.3.1 of the Building Code.

10. The decision

10.1 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 2000:

- pending structural confirmation, the metal glazed balustrade to the lounge deck may not comply with Clause B1
- pending further investigation and repair, some of the timber framing and structural fixings do not comply with Clauses B1 and B2
- the external building envelope does not comply with Clauses E2 and B2

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 26 June 2017.

John Gardiner
Manager Determinations and Assurance