



Determination 2017/066

Regarding the refusal to issue a code compliance certificate for a 19-year-old house with mixed claddings at 16 San Lorenzo Rise, Henderson Heights, Auckland

Summary

This determination is concerned with the compliance of a 19-year-old house. The determination considers the authority's reasons for refusing to issue the code compliance certificate and whether the building work complies with the requirements of the Building Code.

1. The matter to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004¹ ("the current 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 owner of the house, D O'Hara ("the applicant")
- Auckland Council ("the authority"²), 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 the 19-year-old house. The refusal arose because the authority is not satisfied that building work complies with certain clauses³ of the Building Code (First Schedule, Building Regulations 1992). The authority's concerns primarily relate to the weathertightness and durability of the claddings.

1.4 The matter to be determined⁴ is therefore the authority's exercise of its powers of decision in refusing to issue the code compliance certificate for the reasons given in its letter dated 14 July 2016 (see paragraph 3.2). 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 consent was issued. The building envelope includes the components of the systems (such as the wall claddings, the windows, the decks and the roof cladding) as well as the way the components have been installed

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 After the original house building was completed, Waitakere City Council was transitioned into Auckland Council. The term "authority" is used for both

³ In this determination, references to sections are to sections of the current Act and references to clauses are to clauses of the Building Code.

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

and work together. This includes compliance with Clause B1 Structure, as it applies to weathertightness of the house. I consider this in paragraph 6.2.

- (b) Whether other items identified by the authority comply with the relevant Building Code clauses: namely B1 Structure, E1 Surface water, F4 Safety from falling, and G13 Foul water. I consider these clauses in paragraph 6.4.

1.5 Matters outside this determination

1.5.1 In its refusal, the authority limited its concerns to items associated with the clauses outlined above (see paragraph 3.2) and this determination does not address other clauses of the Building Code.

1.5.2 I also note that the applicant can 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 1998. Although I leave this matter to the parties to resolve in due course, I have taken the anticipated modification into account when considering compliance.

1.6 In making my decision, I have considered the submissions of the parties, the report of the expert commissioned by the Ministry to advise on this dispute, and the other evidence in this matter.

2. The building work

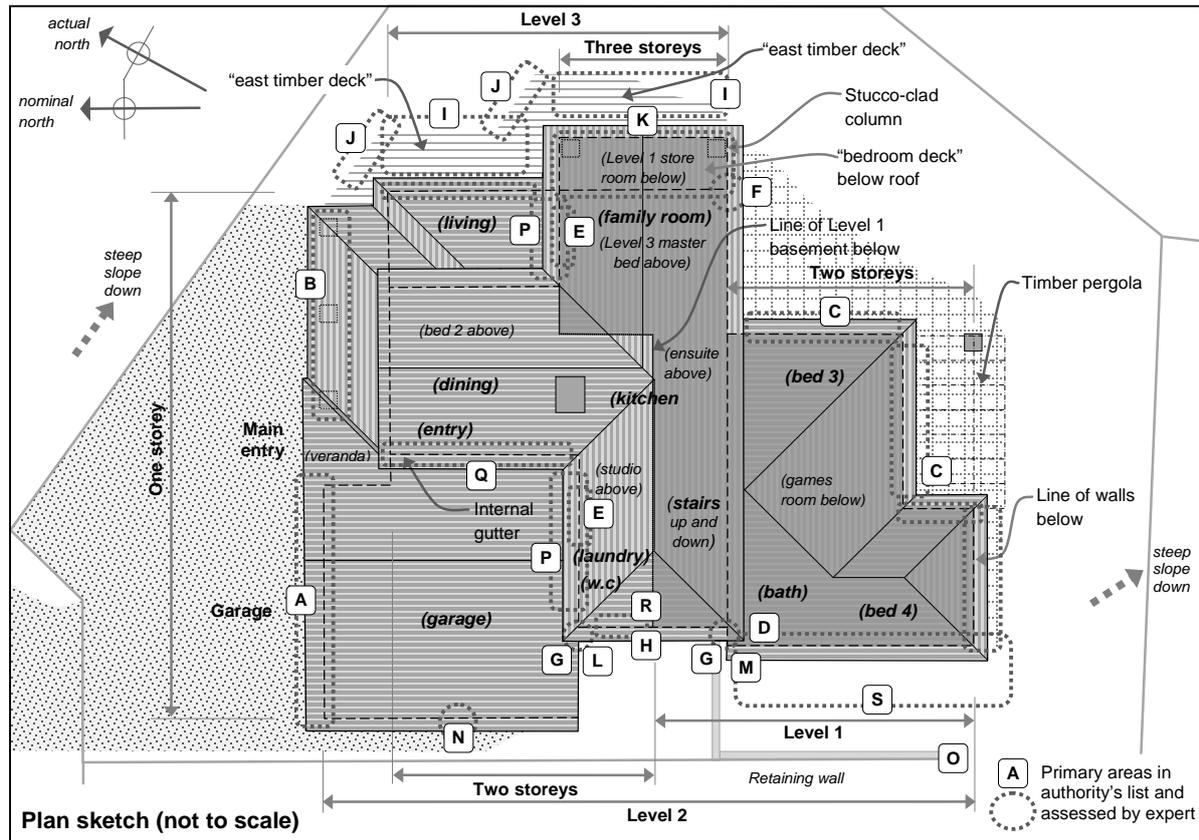
2.1 The building work consists of a detached house that is three-storeys-high in part and situated on a steeply sloping excavated site in a medium wind zone⁵ as defined in NZS 3604⁶. The consent elevations show the road to the north and the expert takes the garage and main entry as north-facing; this determination follows that convention. The house is fairly complex in plan and form and is assessed as having a moderate to high weathertightness risk.

2.2 As shown in Figure 1, the house includes three levels as follows:

- Level 1 (the lower level): the southern part of the house; with a games room to the southwest, bathroom and store room area to the east, and stairs up to the mid level to the west
- Level 2 (the mid level): the full footprint of the house; with the garage to the northwest, the main entry veranda and entry foyer to the north, the living/dining and family room/kitchen area opening onto timber decking to the east (“the east timber deck”), two bedrooms and bathroom to the southwest, and the laundry, toilet and staircase to the west.
- Level 3 (the upper level): the master bedroom, dressing room and ensuite opening onto a deck to the east (“the bedroom deck”), bedroom 2 to the north, and a studio and the staircase to the west.

⁵ According to the bracing calculations

⁶ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

Figure 1: Approximate site plan

2.3 Construction includes specifically engineered concrete slabs and footings, suspended concrete floor slabs above parts of Level 1, concrete masonry foundation walls, retaining and other walls to Level 1 and various steel beams. The remainder is generally conventional light timber frame, with timber framed floors, brick and monolithic wall claddings, aluminium windows and concrete tile roofing.

2.4 The tiled roof is at three different levels, with eaves and verge overhangs that generally vary from about 300mm to 450mm. The upper roof to Level 3 is 30° pitched, with the east verge overhang extended above the bedroom deck. The north of Level 2 includes an 18° pitch gable roof above the garage, which intersects with a lean-to veranda that wraps around the northeast corner. The south of Level 2 has a 15° pitch hipped roof.

2.5 The 'schedule of materials' within the specification calls for wall framing to be 'H1 treated' although the expert noted no evidence of treatment. Given the date of construction in 1997 and the limited decay despite evidence of long term moisture penetration, I consider that the timber framing is likely to be boric treated to a level that will provide some resistance to fungal decay.

2.6 The wall claddings

2.6.1 The concrete masonry walls to the Level 1 southeast storeroom are plastered, and the timber framed walls to the games room are clad in brick veneer that extends up to or beyond the window sills of Level 2 above. The remaining walls of Level 2 are clad in brick veneer up to soffit height. The brick veneer incorporates a 45mm drained and ventilated cavity between the brickwork and the building wrap.

2.6.2 The cladding to the remaining walls of Level 2 and all external walls to Level 3 is a monolithic cladding system described as stucco plaster over a solid backing. In this instance it consists of 4.5 mm fibre-cement sheets fixed through the building wrap directly to the framing timbers, covered by a slip layer of building wrap, 20 mm thick cement plaster and a flexible paint coating.

2.7 The decks

2.7.1 The Level 3 master bedroom opens onto an enclosed deck to the east situated above the family room. The roof extends above the deck, supported by stucco-clad framed columns. The deck floor is spaced timber decking overlaid above a liquid-applied membrane (“LAM”) on a plywood substrate, with open metal balustrades fixed into a timber upstand at the east edge and side-fixed into the column and walls at the sides.

2.7.2 In Level 2, the living and family room areas open onto the east timber deck which is supported on cantilevered timber piles, with a free-draining slat floor and open timber balustrades.

3. Background

3.1 The consent and amendment

3.1.1 The authority issued building consent No. ABA 97001406 to the applicant on 14 November 1997 under the Building Act 1991 (“the former Act”). I note that the applicant was also the builder of the house.

3.1.2 An enclosed store room was built that was additional to the consented work and the authority issued a notice to rectify⁷ for the ‘unauthorised building work’. On 15 January 1998, amended drawings and engineering details were submitted which the authority approved on 19 January 1998 (amendment ABA 98000126).

3.1.3 The authority carried out inspections of the foundations, floor slab and masonry walls to Level 1 in December 1997. The authority also carried out inspections of:

- pre-pour floors, plumbing, footings, foundations, tanking and bond beams during January and February 1998
- pre-plaster during March 1998
- pre-line plumbing on in April 1998
- stormwater and sewer connections in August 1998.

(Although no pre-line building inspection was recorded, it is likely that this was included in the two pre-plaster inspections in March 1998.)

3.1.4 The house appears to have been substantially completed by September 1998, but no final inspection was requested and no code compliance certificate was issued.

3.1.5 It seems that the applicant carried out various repairs and maintenance before seeking a code compliance certificate in 2016. The 2016 inspection photographs indicate that this work included installation of new balustrades and decking to the bedroom deck and repainting of the wall claddings.

⁷ Equivalent to a notice to fix under the current Act

3.2 The 2016 refusal to issue a code compliance certificate

3.2.1 The applicant applied for a code compliance certificate on 20 May 2016 and the authority inspected the house on 29 June 2016. The authority wrote to the applicant on 14 July 2016 to advise that ‘under Section 95A of the Building Act 2004 a code compliance certificate cannot be issued at this stage’ because:

Following the site inspection and subsequent ‘peer review’ process, [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.

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.

3.2.2 The authority listed items that required attention (“the authority’s list”), which were ‘not limited to’ the following (in summary, with relevant locations in brackets – see Figure 1):

1. Cladding:
 - a) Clearances to brick veneer (Area A,B,C, D)
 - b) Clearances to apron flashings and membrane (Area Q)
 - c) Cracks to stucco
 - d) Damaged cladding at end of west stucco/brick flashing stop end (Area H)
 - e) Unsealed plaster to upper west
 - f) Post construction flashings installed (Area H)
 - g) Lack of anti-capillary gap at fascia/wall junction (Area G)
 - h) Cladding/joinery junctions (Area E,H,R,)
 - i) Unknown flashings to deck/upstand and roof/wall junctions (Area F)
2. Cracks to interior plasterboard
3. Decks:
 - a) Lack of bracing (Area I)
 - b) Boundary joist and balustrade to timber deck not compliant (Area I,J)
 - c) Deck membrane under floating decking (Area K)
 - d) Deteriorating deck joists to timber deck (Area I)
 - e) Deteriorating mechanical deck fixings (Area I)
 - f) Timber deck joist spacing not in accord with drawings (Area I)
 - g) Deteriorating timber balustrade (Area J)
4. Drainage:
 - a) Unable to inspect west elevation due to water ponding (Area D, S)
5. Meter box: panels dislodged (Area N)
6. Compliance of new balustrade to bedroom deck (Area K)
7. Plumbing:
 - a) Broken pipe supports (Area L,M)
 - b) Damaged waste pipe to west gulley trap (Area L)

8. Retaining wall: not shown on approved plans (Area O)
 9. Roof:
 - a) Damaged apron flashings and cracked roof tiles (Area P)
 - b) Membrane to internal gutter (Area Q).
- 3.3 It appears that the applicant carried out some further repairs and maintenance to the house then approached a building surveyor about assessing the items in the authority's list. In an email dated 2 November 2016, the building surveyor described destructive testing that would be involved and recommended that a determination be sought to clarify the areas requiring remediation.
- 3.4 The Ministry received an application for a determination on 2 March 2017, which was accepted on 14 March 2017. The Ministry sought further information from the authority, which was received on 22 March 2017. Consent for the expert to undertake invasive testing was not received until 20 April 2017.

4. The submissions

- 4.1 The applicant made no submission to support their application, but provided copies of:
- the consent drawings
 - the building consent dated 14 November 1997
 - the notice to rectify dated 19 December 1997
 - the authority's inspection summary
 - the durability final inspection checklist dated 29 June 2016
 - the authority's refusal to issue a code compliance certificate dated 14 July 2016
 - some correspondence with the authority
 - various emails, statements and other information.
- 4.2 The authority made no submission in response to the application, but forwarded an electronic copy of the following additional documents pertinent to this determination:
- the consent documentation
 - the consent amendment documentation
 - photographs taken during the authority's peer review process.
- 4.3 A draft determination was issued to the parties for comment on 20 July 2017.
- 4.4 In separate responses received on 3 August 2017 the applicant and the authority both accepted the draft determination without further comment.

5. The expert's report

5.1 General

- 5.1.1 As mentioned in paragraph 1.6, 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 1 May and 13 June 2017, providing a report dated 16 June 2017. The expert's report was sent to the parties on 27 June 2017.
- 5.1.2 The expert noted that the scope of his inspection was to provide an opinion about items identified in the authority's refusal letter dated 14 July 2016 and to assess the areas identified by the authority in regard to compliance with the Building Code.
- 5.1.3 The expert considered that claddings, linings and finishes were generally 'of a fair standard' and the overall quality of workmanship appeared moderate. Roof tiling, plaster and brick work were considered to be 'of a fair standard for the time of construction', although some pointing needed maintenance.
- 5.1.4 The expert observed the following differences from the consent drawings during his inspection (with my comments added in brackets):
- The original elevations, sections and excavation plan show paving on fill as a 'patio' to the east of the family room. (I note that the consent amendment drawings add the Level 1 store room and include an amended section that shows a raised timber deck – Area I.)
 - Deck joist spacing is 600mm in lieu of 450mm.
 - Timber pergolas to the east were not constructed.
 - Decorative cedar louvers to the plaster cladding are not installed.
 - The metal balustrade to the bedroom deck (Area K) appears to have been recently replaced.

5.2 Moisture penetration

- 5.2.1 In regard to item #2 in the authority's list, the expert observed minor cracks in plasterboard where joints 'incorrectly' aligned with window jambs. Although these cracks could have resulted from moisture movement in framing, the expert noted that such cracking is common in buildings not affected by moisture problems.
- 5.2.2 The expert took invasive moisture readings into wall and roof framing at various locations related to the authority's list and noted the following readings:
- at the Level 3 bedroom deck
 - 20% in framing below the northeast of the deck membrane (Area K)
 - more than 24% at the northeast stucco-clad column (Area K)
 - 24% at the stucco south upstand/wall junction (Area F)
 - 18% to over 24% beneath the Level 3 master bedroom north window (Area Q)
 - 20% and 38% beneath the Level 3 studio north window, with damaged cement backing sheet, building wrap and framing revealed in a cut-out (Area E)
 - 18% to 24% under the sill to Level 3 studio west window (Area R)
 - 18% to 20% at head flashing and jambs to Level 2 toilet west window (Area H)
 - 18% to 24% at door sill to Level 1 games room south window (Area P).

Moisture readings over 18% generally indicate that external moisture is entering the structure and further investigation is needed.

5.3 The brick veneer

5.3.1 Item #1a) of the authority's list identified concerns about the brick veneer clearances including weep holes, and the expert noted that the bottom course of bricks and the drainage slots were below paving in some areas. Item #4 in the authority's list also noted that drainage could not be assessed along the west elevation due to water ponding (Area S).

5.3.2 In regard to the brick veneer base details, the expert noted that:

- the driveway was poured against the brick to the north garage wall (Area A)
- paving almost covers the bottom bricks of a north veranda column (Area B)
- the decking to the east timber deck aligns with the north veranda tiling and butts against the bottom brick mortar joint, with no drainage gaps and debris/plant growth accumulating (Area I)
- where water ponds along ground against Level 1 west wall (Area D,S):
 - the ground was soft and ponding on both inspection days
 - clearance varies from 0-80mm, with elevated moisture in the bottom plate
 - lining removal revealed water-marked plywood and framing, with corroding fixings (Area D)
 - water can penetrate weep holes and rise sufficiently to reach the bottom of the plywood where it overlapped the top of the slab rebate
 - water can then transfer through the plywood and into the bottom plate
- the same mechanism of moisture transfer is likely to have caused elevated moisture in bottom plates where paving aligns with the bottom brick mortar joint at the Level 1 games room east and south walls (Area C).

5.4 The stucco cladding

5.4.1 Item #s 1c), 1d) and 1e) of the authority's list identified cracks, damage and unsealed plaster to some stucco areas. However, the applicant confirmed that maintenance had been carried out since the authority's inspection.

5.4.2 In regard to joinery details (Item #1h) of the authority's list):

- Windows in stucco cladding are face-fixed over unsealed plaster, with head flashings, no jamb seals and no sill flashings (as was common at the time).
- In regard to metal head flashings, the expert observed:
 - sufficient extension past the jambs but no stop ends
 - a lack of fall away from the cladding
 - high moisture levels beneath a head/jamb junction to the Level 2 toilet west window (Area H).
- In regard to the sill details, the expert noted that:
 - flat-topped polystyrene 'sills' were planted prior to paint coatings
 - sills butt against bottom edges of aluminium sill flanges

- moisture on the flat sill top can penetrate the unsealed junction into unsealed plaster where it cannot drain away
- moisture penetrating unsealed window jambs is also unable to drain.
- Where high moisture levels were recorded under Level 1 studio north window (Area E), the expert dye-tested the sill/cladding junction – removing a small section of stucco and sill from the sill/jamb junction and noting that:
 - dyed water penetrated the edge of the sill flange onto unsealed plaster
 - dyed water quickly penetrated onto underlying backing sheets
 - underlying slip layer and backing sheets were damaged
 - underlying timber was water stained with ‘moderate damage’.
- Elevated invasive moisture readings were recorded at or below other windows (Areas E, H, R) with similar installation details. The defects were therefore considered systemic and it was therefore ‘highly likely that water damage has occurred’ at other similar windows.

5.4.3 Item #s 1f) and 1g) of the authority’s list included retrofitted flashings and fascia/wall junctions. The expert noted that:

- although the location of ‘retrofitted flashings’ is unclear, it is assumed to refer to the horizontal inter-cladding flashing between the brick and stucco – where flashing ends are sealed against the stucco (Area G)
- the above flashings appear to be performing satisfactorily, with stop ends installed – moisture penetration above junctions with window jambs relate to water penetrating window junctions above these flashings (Area G,H)
- the steel fascia was installed prior to the stucco and the ends are buried into plaster, with staining and mould growth along the plaster edges (Area G).

5.5 The bedroom deck (Area F, K)

5.5.1 I note that the consent drawings called for the Level 3 bedroom deck to be ‘selected glazed ceramic tiles (to fall) on 1.0mm butynol lining on plywood’. No upstands are shown, drawings note ‘fall to grate & slope tile edge’, and top-fixed balustrades are noted as ‘galv. steel handrailing paint finish (screw fixed toughened glass behind)’.

5.5.2 The deck appears to have been originally constructed with the membrane on plywood floor falling to the east and stucco-clad upstands at the ends. The deck membrane wraps over a plywood drip edge, avoiding the need for a drain.

5.5.3 The deck appears to have been changed and is currently constructed as follows:

- A LAM is applied over the plywood substrate, with stucco-clad upstands between the bedroom east wall and stucco-clad corner columns.
- A removable timber slat floor has been installed, with timber facings forming an upstand to which balustrade posts are fixed. (The upstand is assumed to be installed over spaced blocking to maintain drainage over the eastern edge).
- The membrane floor wraps over the original plywood drip edge, with plaster extended over the front face of the plywood. New metal balustrades are top-fixed into the east timber upstand, and side-fixed into wall and corner columns.

5.5.4 Item #s 1a), 1i), 3c) and 6 of the authority's list identified concerns about the recently installed balustrade and decking (see paragraph 3.1.5) and the expert noted:

- high moisture levels were recorded at the south stucco upstand/wall junction
- moisture was also elevated below membrane at the northeast deck/column junction, where a small piece of plaster was removed from the drip edge to reveal soft wet plywood and 'no notable' fibre reinforcing in the membrane
- the screws to the side fixing plates securing either end of the balustrade are approximately 23mm in from the outer edge of the plaster; taking account of the thickness of the cladding (plaster and backing sheet) the fixings are unlikely to be secured into the timber framing.

5.6 The east timber deck (Area I, J)

5.6.1 Item #s 3a), 3b), and 3d) to 3g) of the authority's list identified concerns about the structure, safety and condition of the east timber deck and its balustrades. Although the expert noted that the deck felt safe to walk on, with no 'immediate safety concerns', he noted the following needed attention:

- The cantilevered timber piles extend to about 1.95m above ground, with no bracing installed.
- Joist spacing is at about 600mm centres in lieu of 450mm shown in the drawings.
- Bolts to stringers are corroded and installed without adequate washers.
- There is some surface deterioration to joists and treatment level is unknown.
- Although the bolt fixings to the timber balustrade appear secure, the balustrade flexes when pressure is applied and moves the boundary joists with it.
- Some infill battens to the balustrade are loose, creating gaps larger than 100mm.
- A gap has opened at the mitre to the top rail.

5.7 The roof

5.7.1 Item #s 9a) and 9b) of the authority's list identified concerns about the roofing, the roof junctions and the roof flashings. The expert noted:

- the lead apron flashings have deteriorated and cracked in places, but do not appear to have caused any significant water penetration to date (Area P)
- some concrete tiles above the garage and entrance are cracked, but do not appear to have caused any significant water penetration to date
- the internal gutter to the west wall of bedroom 2 appeared satisfactory, and although reliant on sealant, the complex junction with the valley gutter appears to have been weathertight to date (Area Q).

5.8 Other items on the authority's list

5.8.1 The expert also noted the following in regard to other items in the authority's list:

- Item #7a): Broken pipe supports at two locations (Area L, M)
- Item #7b): Damaged waste pipe at the west gully trap (Area L)

- Item #5: Missing clear panel on the electrical meter box (Area N).

5.9 Summary

5.9.1 The expert considered that the following items did not meet the performance requirements of the Building Code (in summary, with the applicable clauses in brackets):

- Systemic defects in window installation within the stucco cladding, resulting in moisture penetration at various junctions. (E2,B2)
- Lack of clearances to the bottom of the brick veneer in a number of areas, resulting in impeded drainage through the weep holes and associated moisture penetration. (E2,B2)
- Lack of surface water drainage to ground at the west wall of Level 1. (E1, E2)
- Deteriorating and inadequate balustrades and framing to the east timber deck. (B1, B2, F4)
- Inadequate fixings of the balustrades to the east bedroom deck. (F4)
- Lack of weathertightness of the bedroom deck, with moisture penetration into various junctions, and inadequate balustrade installation. (E2, B2, F4)

5.9.2 The expert also considered that the following areas needed to be addressed as maintenance but were not currently affecting the performance and therefore the compliance of the building (in summary):

- Broken pipe supports and damaged wastewater pipe. (G13)
- The cracked roof tiles and lead apron flashing. (E2, B2)
- Deteriorating pointing to some areas of the brick veneer. (E2, B2)
- The missing clear panel to the electrical meter box. (G9)

6. Discussion: the compliance of the house

6.1 General

6.1.1 The building consent considered in this determination was issued under the former Act, and accordingly the transitional provisions of the current 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 In order to determine whether the authority correctly exercised its power in refusing to issue a code compliance certificate, I must therefore consider whether the house complies with the provisions of the Building Code that applied when the consent was issued in 1997.

6.2 Clause E2 External moisture, and B2 Durability

6.2.1 The evaluation of the external building envelope for compliance with the Building Code and the risk factors considered in regards to weathertightness have been described in numerous previous determinations (for example, Determination 2004/1).

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

Increasing risk

- The house is three-storeys high in part and fairly complex in plan and form.
- The house has two different wall claddings.
- Roofs are at multiple levels, with complex junctions.
- The stucco cladding is directly fixed to the framing.
- There is an enclosed deck above the family room.

Decreasing risk

- The house is in a medium wind zone.
- There are roof overhangs to provide some shelter to the wall cladding.
- The brick veneer includes drained cavities.
- The external wall framing is likely to be treated to provide resistance to decay.

6.2.3 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 stucco cladding at all risk levels; however, this was not a requirement at the time of construction in 1997.

Weathertightness performance

6.2.4 Inspection records indicate that the house was substantially complete and occupied during 1998 (see paragraph 3.1.4) and I have taken that into account when considering the weathertightness performance of the external building envelope as most of the building envelope appears to have continued to perform for more than the minimum 15 years required by Clause B2 of the Building Code.

6.2.5 Taking account of the repairs carried out to date, I note the expert's conclusions in paragraph 5.9 and I consider that the following areas require attention:

- Windows installed in the stucco cladding.
- Blocked weep holes and lack of ground clearances to the brick veneer.
- The ends of fascia boards buried into the plaster.
- Moisture penetration and/or investigation into the extent of damage to framing associated with current or past defects at:
 - windows installed in the stucco cladding
 - the deck columns and deck floor framing underlying the bedroom deck
 - bottom plates to Level 1 games room.

Weathertightness conclusion

6.2.6 The expert's report establishes that the current performance of the building envelope is not adequate because there is evidence of moisture penetration and this is likely to have been occurring for some time. I am therefore satisfied that the building envelope did not and still does not comply with Clause E2 of the Building Code.

- 6.2.7 The house is also 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.
- 6.2.8 Although roof and wall claddings are now 19 years old, the expert's investigations revealed evidence of moisture ingress over an extended period. Given the evidence of past moisture penetration and the likelihood of undiscovered damage, I am satisfied that the external building envelope has not complied with Clause B2 insofar as it applies to Clause E2.
- 6.2.9 However, the identified moisture penetration and cladding faults occur in discrete areas and I am therefore able to conclude that satisfactory investigation and rectification of areas outlined in paragraph 6.2.5 will result in the building envelope being brought into compliance with Clauses B2 and E2 of the Building Code.
- 6.2.10 I note the expert's conclusions regarding moisture penetration and the possible effects on the timber framing's compliance with Clause B1 Structure, but I have insufficient evidence on which to make a decision in this respect.

6.3 The remaining clauses

- 6.3.1 In regard to the authority's concerns about the east timber deck, the expert's investigation satisfies me that the deck structure, including the timber balustrades, may not comply in some respects with Clause B1 of the Building Code.
- 6.3.2 Taking account of the expert's report, I consider the following areas require attention (with relevant clauses shown in brackets):
- Potentially damaged timber framing (B1, B2):
 - in bottom plates and plywood sheet to Level 1 games room walls
 - in framing associated with identified weathertightness defects
 - in framing and substrates to the east bedroom deck.
 - The east timber deck structure and balustrades. (B1, B2, F4)
 - The east timber deck. (B1, B2, F4)
 - The east bedroom deck balustrade fixings. (F4)
 - The lack of surface water drainage to ground at the west wall of Level 1. (E1)
- 6.3.3 I consider the broken pipe supports and damaged wastewater pipe to be matters of maintenance to be addressed by the applicant in due course. (G13)

6.4 Maintenance

- 6.4.1 In regards to maintenance 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 roof and wall claddings in order to ensure their ongoing weathertightness.
 - A modification of the durability provisions means that most areas of the external building envelope have remained weathertight for more than the required 15 year period. However, the expected life of the building as a whole is considerably longer; and careful maintenance of the claddings is needed to

ensure the underlying structural framing remains undamaged by moisture entry for its minimum required life of 50 years.

- Although not currently affecting the performance and compliance of the house, the expert has noted areas where maintenance is needed in order to reduce future risks to ensure ongoing compliance.

6.4.2 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 (for example, Determination 2007/60).

6.5 Conclusions

6.5.1 Taking account of the expert's report, Table 1 summarises my conclusions on the authority's concerns identified for this house. Table 1 also identifies areas where maintenance is required or recommended.

Table 1: Conclusions on the authority's list

Areas of concern (using the authority's reference numbers)		Comments	Conclusions
			Compliance (para. 6.2.5, 6.4.1) Maintenance (para. 5.9.2)
B1 Structure			
3a)	Deck bracing	(I) • 1.9m high piles not braced	Structural assessment and repair required
3b)	Boundary joist and balustrade	(I,J) • Balustrade flexes and moves boundary joist with it	
3d)	Deteriorating joists	(I) • Surface deterioration • Treatment level unknown	
3e)	Deteriorating fixings	(I) • Bolts corroded	
3f)	Deck joist spacing	(I) • 600mm in lieu of 450mm	
3g)	Deteriorating balustrade	(J) • Balustrade able to flex • Some battens loose, with large gaps • Gap opened in mitred handrail	
2	Plasterboard cracks	• Minor cracks at joints where aligned with window jambs • Sheet layout not in accord with manufacturer's instructions • Common and unlikely to result from moisture or structural problems	Complies
8	Retaining wall not on drawings	(O) • Wall assumed to have existed since 1997, why compliance raised now? • Was wall part of the consented work, does it affect consented work? • Would it now be considered exempt work?	To be resolved between parties

E2 External Moisture			
1a)	Clearances to brick veneer	(A, B, C, D) <ul style="list-style-type: none"> • Driveway poured against brick • Weep holes partly or fully blocked • Water penetrating up to floor level • Elevated moisture in bottom plates 	Repairs required
1b)	Clearances to apron flashings and membrane	(P, Q) <ul style="list-style-type: none"> • Internal gutter operating satisfactorily • Lead apron cracking • No evidence of associated moisture penetration 	Complies Apron cracks require maintenance
1c)	Cracks to stucco	Maintenance carried out since authority's inspection	Complies
1d)	Damaged cladding		
1e)	Unsealed plaster		
1f)	Post-construction flashings installed	(G, H) <ul style="list-style-type: none"> • Stucco/brick junction flashing sealed against stucco at ends • No associated moisture penetration 	Adequate given regular maintenance
1g)	Lack of anti-capillary gap at fascia/wall junction	(G) <ul style="list-style-type: none"> • Fascia install prior to stucco • Staining along plaster edges 	Repairs required
1h)	Cladding/joinery junctions	(E, R, H) <ul style="list-style-type: none"> • Systemic defects in windows within stucco • Head flashings lack fall • Flat-topped 'sills' trap moisture at junction with window flanges • High moisture levels and damage to underlying backing sheets, wrap and timber 	Investigation and repair required
1i)	Unknown flashings to deck/upstand and roof/wall junctions	(K, F) <ul style="list-style-type: none"> • Construction not as per drawings • LAM used in lieu of butyl rubber • Likely to have been recently altered • High moisture levels at upstand/wall junction and column/deck floor junction 	Investigation and repair required
3c)	deck membrane under floating decking	(K) <ul style="list-style-type: none"> • Insufficient LAM over drip edge • High moisture levels and damaged plywood at membrane /lower wall junction 	Investigation and repair required
4	Water ponding on west elevation	(R) <ul style="list-style-type: none"> • Water covered weep holes at authority's inspection • Still ponding at expert's inspection • Moisture penetration into wall 	Repair required
9a)	Damaged apron flashings and cracked roof tiles	(P) <ul style="list-style-type: none"> • Lead apron flashings cracked in places • Several cracked concrete tiles • No associated moisture penetration 	Complies Maintenance needed
9b)	membrane to internal gutter	(Q) <ul style="list-style-type: none"> • Internal gutter appears satisfactory • Complex junction with valley gutter is sealant reliant • No associated moisture penetration 	Complies Reliant on ongoing maintenance

F4 Safety from falling			
3g)	Deteriorating balustrade to east timber deck	(J) <ul style="list-style-type: none"> Balustrade able to flex Some battens loose, with large gaps Gap opened in mitred handrail 	Repair required
6	New balustrade to bedroom deck	(K) <ul style="list-style-type: none"> Bedroom deck balustrade recently replaced Side fixings unlikely to reach framing Stability of top fixings unknown 	Investigation and repair required
G9 Electricity			
5	Meter box panel	(N) <ul style="list-style-type: none"> Clear panel missing 	Repair required
G13 Foul water			
4a)	Unable to inspect west due to water ponding	(L) <ul style="list-style-type: none"> No additional items noted See comments on E1 above 	
7a)	Broken pipe supports	(L, M) <ul style="list-style-type: none"> Broken pipe supports at two locations 	Complies Maintenance item
7b)	Damaged waste pipe to west gulley trap	(L) <ul style="list-style-type: none"> Bottom of waste pipe broken, pipe does not fully discharge into gulley 	Repair required

7. The durability considerations

- 7.1 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).
- 7.2 In this case the 19-year delay since substantial completion of the house in 1998 raises concerns that many elements of the building are now beyond their required durability periods, and would consequently no longer comply with Clause B2 if a code compliance certificate were to be issued effective from today’s date.
- 7.3 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 the house had been issued in 1998.
- 7.4 I therefore leave the matter of amending the building consent to modify Clause B2.3.1 to the parties to resolve in due course.

8. What happens next?

- 8.1 The authority may issue a further notice under section 95A of the current Act. The notice should include the investigations and defects identified in this determination 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 applicant to propose and for the authority to accept or reject.
- 8.2 The applicant should develop and submit a detailed proposal to the authority to address the matters of investigation and non-compliance, produced in conjunction with a suitably qualified person experienced in weathertightness remediation and

addressing the defects identified in paragraph 6.2.5 and paragraph 6.3; including appropriate investigation and timber sample testing to determine the extent and significance of any hidden damage to the timber framing. The proposal should be submitted to the authority for its consideration and approval. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

8.3 Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

9. The decision

9.1 In accordance with section 188 of the Building Act 2004, I hereby determine that, in regard to the Building Code that was in force at the time the original building consent was issued in 1997:

- the east timber deck does not comply with Building Code Clauses B1, B2 and F4
- the exterior building envelope does not comply with Clauses E2 and Clause B2
- the balustrades to the east timber deck and the bedroom deck do not comply with Clause F4
- the electrical meter box does not comply with Clause G9
- the lack of surface water drainage to ground at the west wall of Level 1 does not comply with Clause E1

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

9.2 I consider there is insufficient evidence to establish whether the timber framing complies with Clause B1 Structure.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 14 August 2017.

John Gardiner
Manager Determinations and Assurance