



## Determination 2014/048

# The refusal to issue a code compliance certificate for 10-year-old alterations and additions to a house at 19 Kellsmere Crescent, Island Bay, Wellington



### 1. The matters to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004<sup>1</sup> (“the 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, P Vinaccia (“the applicant”) acting through the architect
- the Wellington City 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 10-year-old alterations and additions to a house because it was not satisfied that the building work complied with certain clauses<sup>2</sup> of the Building Code (First Schedule, Building Regulations 1992). The authority’s concerns primarily relate to the weathertightness of the wall cladding.

1.4 The matter to be determined<sup>3</sup> is therefore whether the authority was correct to refuse to issue a code compliance certificate. In deciding this, I must consider:

#### 1.4.1 Matter 1: Weathertightness

Whether the external building envelope of the alterations complies with Clause B2 Durability and Clause E2 External Moisture of the Building Code. The building envelope includes the components of the systems (such as the new and replaced wall claddings, windows, roofing and decks), as well as the way the components have been installed and work together. I consider this matter in paragraph 8.

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

<sup>2</sup> In this determination, unless otherwise stated, references to sections are to sections of the Act and references to clauses are to clauses of the Building Code.

<sup>3</sup> Under section 177(1)(b) and 177(2)(d) of the Act

## 1.4.2 Matter 2: The remaining code requirements

Whether other items identified by the authority comply with relevant Building Code clauses: E3 Internal Moisture, F4 Safety from falling and H1 Energy Efficiency. I consider these clauses in paragraph 9.

## 1.5 Matters outside this determination

1.5.1 The authority has stated that the applicants may apply to the authority for a modification of Clause B2.3.1 to allow durability periods to commence from the date of substantial completion of the alterations. Although I leave this matter to the parties to resolve in due course, I comment on the matter in paragraph 10.

1.5.2 The following building consents have been issued for this house:

- No. SR 87035 in 2002 for alterations to the house (“the first consent”)
- No. SR 278128 in 2013 for deck repairs (“the second consent”)

Work under the second consent has been carried out but no code compliance certificate has been issued. Although I take into account likely reasons for the deck repairs carried out under the second consent and any evidence revealed during that work, this determination is limited to building work undertaken under the first consent.

1.6 In making my decisions, I have considered the submissions of the parties, the two reports 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 considered in this determination consists of extensive additions and alterations to an existing house on a large level excavated site in a very high wind zone for the purposes of NZS 3604<sup>4</sup>. The site is located in a high corrosion zone. Exposure to the weather is moderated by the contours of the north-facing slope, the excavation into the slope and the surrounding mature trees. The house is complex in form and is assessed as having a high weathertightness risk.

### 2.2 The original house

2.2.1 The original building was a traditional two-storeys-high 1930’s house (“the original house”), which had timber-framed walls and subfloor, stucco claddings to lower walls, bevel-backed weatherboard claddings to upper walls, timber windows and steep-pitched clay tile hipped roofs.

2.2.2 The living areas and a study are accommodated on the ground floor, with an open recessed loggia at the north end. The original kitchen and laundry areas were housed in a lean-to against the south wall. The upper level provided three bedrooms and a sunroom, with a deck on the north east corner above the loggia.

### 2.3 The 2003 alterations and additions

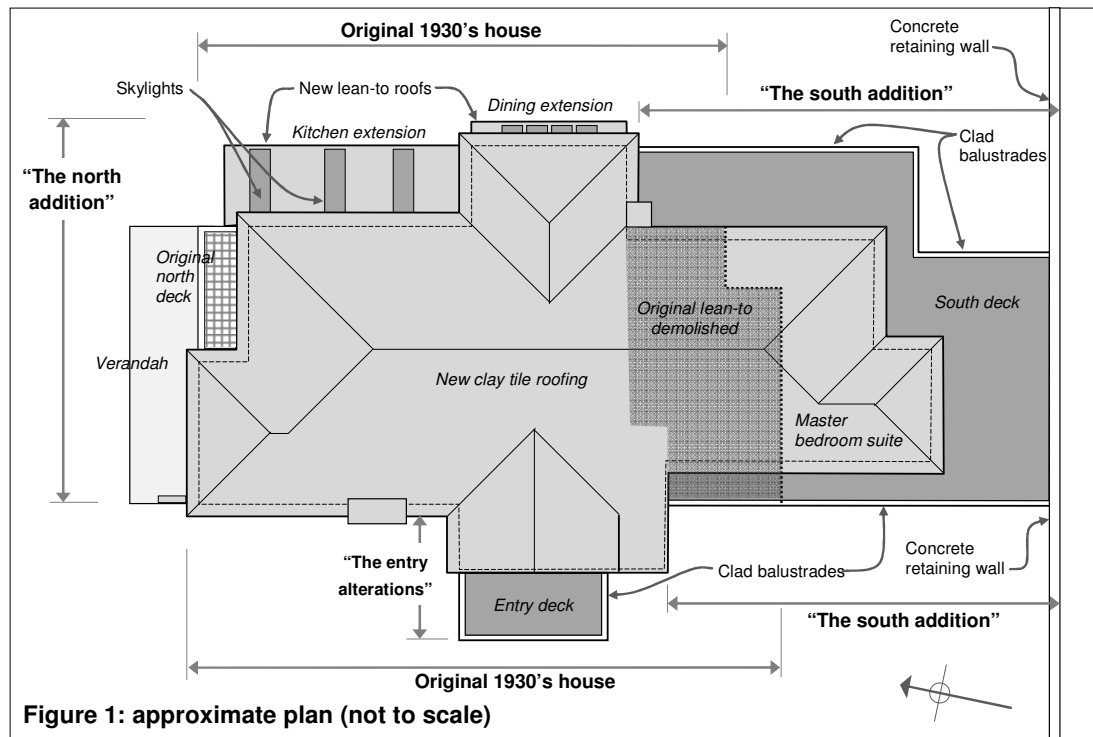
2.3.1 The subject alterations are shown in Figure 1 and included

- demolition of the original kitchen and laundry lean-to
- a large extension to the south (“the south addition”)

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<sup>4</sup> New Zealand Standard NZS 3604:1999 Timber Framed Buildings

- alterations and additions to the north and east (“the north additions”)
- a minor addition at the main entry to the west (“the entry alterations”).



## 2.4 The alterations and additions

2.4.1 The south addition included the demolition of the single-storey lean-to that housed the original kitchen and laundry and the addition of a large extension to provide

- a games room across the full width of the building
- a double garage, laundry and back door
- a master bedroom, walk-in wardrobe and ensuite bathroom on the upper level
- a roof deck surrounding the master bedroom (“the south deck”).

2.4.2 The north additions included alterations and additions to the original living and dining rooms to provide

- a new kitchen under a lean-to roof to the east wall
- a small lean-to roof with skylights to extend the dining area to the east
- the living area extended into and stepping down to the original north loggia
- a veranda to the north.

2.4.3 The entry alterations included removal of the original study to provide

- an expanded entry foyer
- a toilet area
- a new entry porch with a deck above (“the entry deck”).

2.4.4 The upper floor alterations included removal of the original

- bathroom areas to provide an additional bedroom

- partitions to provide two bedrooms and a bathroom
- linen store to provide a corridor into the new master bedroom suite.

## 2.5 The completed house

- 2.5.1 Construction is generally conventional light timber frame, with some specifically engineered elements, including concrete slabs and foundations to the south addition, a concrete block retaining wall to the south of the garage and steel portal frames. Upper walls are clad in weatherboards to match the original, with monolithic cladding to all remaining walls and timber doors and windows. The steep-pitched hipped roofs are clad in clay tiles, with eaves of about 500mm overall.
- 2.5.2 Given its age, the original house framing is likely to be rimu. During additional investigations as outlined in paragraph 6.3.3, laboratory analysis indicated that deck and framing timbers used in the alterations were ‘most likely untreated radiata pine’. Given this and the date of construction during 2003, I consider that the wall and deck framing in these additions are not treated to resist fungal decay.

## 2.6 The monolithic cladding

- 2.6.1 The original stucco cladding to lower walls was replaced as part of the building work and all lower walls have a form of monolithic cladding system known as EIFS<sup>5</sup>. In this instance, the proprietary cladding system consists of 40mm polystyrene backing sheets fixed through polystyrene battens and the building wrap to the framing, over which a mesh reinforced plaster coating has been applied. The system includes purpose-made flashings to windows, edges and other junctions. The cladding was installed by an approved applicator who provided a 5-year ‘applicator warranty’ dated 24 February 2004 for the application of the system.
- 2.6.2 The cladding manufacturer provided a 15-year materials warranty dated 24 February 2004 for the EIFS system. The manufacturer carried out a visual inspection of the EIFS in January 2014 and in a statement dated 21 February 2014 stated that the plaster finish appeared to be ‘of a satisfactory standard’, with ‘no obvious defects in the cladding’. The statement noted that the cladding was about 10 years old and it ‘would be prudent to carry out appropriate maintenance’.

## 2.7 The decks

- 2.7.1 The house has three decks situated above living or garage areas. Balustrades are generally timber-framed, with weatherboard cladding to both faces and handrails fixed to timber cappings. Deck floors were originally finished with tiles over liquid-applied membrane and the refurbished original deck at the north end retains the tiles.
- 2.7.2 The south deck has framed balustrades to the east and west, with access to the south bank at the retaining wall. The weatherboard-clad balustrades to the south and entry decks incorporate gaps at junctions with the upper walls. Tiles were removed from the south and entry decks and the liquid-applied membrane was replaced with butyl rubber in 2013.

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<sup>5</sup> Exterior Insulation and Finish System

### **3. Background**

- 3.1 The architect originally applied for a building consent on 10 April 2002. I have not seen a copy of the building consent, but it appears that the consent (No. SR 87035) was issued under the Building Act 1991 (“the former Act”) in about mid-2002.
- 3.2 The design was subsequently reduced in scale and an amendment to the consent was lodged on 4 September 2002. I have not seen the approval of that amendment, but construction commenced in late 2002. The engineer inspected the specifically designed elements and provided a ‘Producer Statement – PS4 – Construction Review’ dated 22 December 2003.
- 3.3 I have not seen records of inspections undertaken by the authority during construction but I note that the authority based its consent fees on the following inspections:
- foundations and floor slabs
  - retaining walls
  - under slab plumbing
  - preline building and plumbing
  - plaster.
- 3.4 The authority carried out a final inspection on 23 December 2003. The inspection records ticks all items as passed except for Clauses D1 and F4. The record identifies various documents to be submitted and identifies the following outstanding items:
- Complying handrails required for internal stairs.
  - Safety barriers to come at the top of the retaining wall or the ground to be lowered to 900mm below the wall.
  - Confirm bathroom glass to be type A safety glass.
  - Under floor vents to have concrete surrounds if lawn or garden is to be raised.
  - Lay insulation in ceiling more compact.
- 3.5 The required documents were provided and an email from the authority dated 22 January 2004 agreed with the architect that as the internal stairs were original a handrail was not required for a code compliance certificate.
- 3.6 On 22 January 2004, the architect provided a ‘completion certificate’, which stated that the works had been inspected and were ‘certified as being practically complete.’ According to the architect and the builder a code compliance certificate was subsequently applied for, but there is no copy of the application form.
- 3.7 There is no record of further correspondence until the architect sought a building consent in 2013 for deck modifications and the second consent was issued. Repairs were carried out, during which the lack of a code compliance certificate for the first consent became apparent.

### **3.8 The authority’s refusal to issue a code compliance certificate**

- 3.8.1 The architect sought a code compliance certificate on behalf of the applicant, and the authority inspected the building work on 13 December 2013. In a letter to the architect dated 11 February 2014, the authority noted that its inspection had identified various matters that needed to be addressed before a code compliance certificate could be considered.

- 3.8.2 In regard to the exterior building envelope, the authority stated that it required a report from a registered building surveyor which confirmed that ‘the performance requirements of the relevant building code clauses are being met’.
- 3.8.3 The authority stated that the surveyor’s report would need to include ‘adequate testing’ to support conclusions and a ‘repair schedule for any proposed remedial work’ to be approved prior to any work commencing. The authority noted the report should address issues identified, including (in summary):
- consented internal wet area membranes
  - monolithic cladding system
  - floor and cladding clearances to exterior paving or ground
  - with regard to the tiled decks
    - the tile and membrane system on the north deck
    - the condition of underlying framing to all decks
    - cladding clearances to deck floors
    - cladding to membrane junction to south wall of garage
    - timber cappings and top-fixed handrails.
- 3.8.4 Other items identified by the authority included (in summary):
- the height of and gaps in deck balustrades
  - building wrap at bottom of cladding
  - barriers to the top of the retaining wall
  - insulation of external pipe work to water heaters
  - gaps to claddings, facings and scribes
  - lack of a handrail to internal stairs.
- 3.8.5 The authority also noted that amendments to the building consent were needed to allow for the change in the consented roof cladding and to allow for the deck floors to the garage and entry decks replaced under consent SR 278128.
- 3.8.6 The authority attached an application form for a modification of the durability periods in Clause B2.3.1 to commence from the date of substantial completion of the alterations, and concluded that a ‘site meeting is advisable to clarify the content of this letter before any remedial work commences’.
- 3.9 The Ministry received an application for a determination on 28 February 2014.

## **4. The submissions**

### **4.1 The applicant’s submissions**

- 4.1.1 The architect made a submission on behalf of the applicant in an email to the Ministry dated 24 February 2014, and noted the following (in summary):
- The same owner has been in residence since the additions were completed, with no leaks relating to deck balustrades, the cladding type, or interior wet area membranes.

- Balustrade bottom plates were exposed during replacement of deck membranes and no evidence of water damage or leaking was revealed.
- The interior stairs are original and were not part of the building consent, with the authority agreeing at the time that a handrail was not required.
- The shower areas are directly above living areas and no leaks have occurred over the past 10 years.
- All required producer statements were provided on completion of the additions and an application for a code compliance certificate was submitted at the time.

4.1.2 The applicant forwarded copies of:

- some of the as-built drawings, revised on 16 January 2003
- standard details for the monolithic cladding
- the final inspection record dated 23 December 2003
- the email from the authority dated 22 January 2004
- the 'completion certificate' dated 22 January 2004
- the letter from the authority dated 11 February 2014
- the letter dated 21 February 2014 from the builder responsible for the 2013 deck repairs under the second building consent
- photographs of some deck framing exposed during 2013 repairs
- various certificates, producer statements, warranties and other information. other photographs and information.

4.2 The authority made no submission but forwarded a CD-Rom which contained some additional documents pertinent to this determination including:

- the original consent drawings and specifications
- the application for the original building consent
- the application for an amendment to the building consent
- the amended drawings
- various certificates, producer statements, warranties and other information.

4.3 Copies of the submissions and other evidence were provided to each of the parties.

#### **4.4 The first draft determination**

4.4.1 Following the expert's first report, a draft determination was issued to the parties for comment on 25 June 2014.

4.4.2 The authority did not accept the draft and, in a letter to the Ministry dated 22 July 2014, referred to two attached photographs taken during its inspection on 13 December 2013; making the following comments (in summary):

- Any further invasive testing required in the draft determination must include the front entry area, because water staining as shown in the photograph was observed to the wing wall cladding below the deck.

- The determination should also include the requirement for an investigation of the south roof deck framing because earlier removal of the garage ceiling lining revealed water staining and possible fungal growth to the timbers.

4.4.3 The architect responded to the above letter in an email dated 22 July 2014. The architect referred to the letter dated 21 February 2014 from the builder responsible for deck repairs to the above areas under the second building consent in 2013. The architect noted the following (in summary):

- The water staining observed to the wing wall under the front entry deck was the result of an isolated leak at the eaves, which was repaired when the deck membrane and tiles were replaced.
- The garage roof deck had an isolated leak resulting from 'foliage fall on the tiles', which was repaired when deck membrane and tiles were replaced.
- During the repair work, sections of lining were removed to allow inspection of the entry deck and garage deck framing and the builder observed 'no rot, stacky mould or decay'.

## **4.5 The second draft determination**

4.5.1 Following responses to the first draft determination, I commissioned the expert to revisit the house and to carry out invasive investigations in order to confirm, or otherwise, the findings of his first report. The expert's additional investigations are outlined in paragraph 6.

4.5.2 Following completion of the expert's addendum report, I amended the draft determination as I considered appropriate and a second draft determination was issued to the parties for comment on 16 September 2014.

4.5.3 Both parties accepted the second draft without comment.

## **5. The expert's first report**

5.1 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 Architects. The expert inspected the house on 13 March 2014 and 7, 8, 16 and 21 May 2014. The expert provided a report dated 21 May 2014, which was forwarded to the parties on 4 June 2014.

### **5.2 General**

5.2.1 The expert noted that the alteration work had been 'carried out to a particularly high standard' and the house was well maintained, noting that excess building wrap at the bottom of the cladding had been trimmed and all gaps to cladding, facings and scribes appeared to have been attended to. However, the expert also noted that 'there are a few areas requiring better attention to detail' and reported his findings in regard to the authority's list of concerns.

5.2.2 The expert considered the consent drawings were of 'a poor standard, difficult to read, badly annotated and containing a number of errors'. No specific EIFS details were provided, the specification was 'a fairly generic document', and information was 'sketchy and minimal with little clarity as to what was done and when'. Because of the lack of clarity, the expert found it difficult to compare as-built construction with the consent documents, although he noted the change in roof cladding.



## Clause E2: External Moisture

### 5.3 Moisture testing and destructive investigations

- 5.3.1 The expert inspected the EIFS cladding and found no evidence of inadequate installation, water penetration or framing damage. The cladding was installed over a cavity and appeared to be generally sound, with 'no cracks or failures'. The expert noted that the base appeared to accord with the manufacturer's instructions.
- 5.3.2 The expert noted that the architect specifically requested that invasive assessment be limited to inspections through removed electrical fittings. The expert did not consider this to be an acceptable method of inspection as it limits assessments to areas that may be remote from at-risk details and is also hazardous.
- 5.3.3 As a result, the expert carried out non-invasive moisture testing and took invasive moisture readings using long probes into the framing where readings were elevated. In addition, the expert removed a small area of weatherboard at the top of a south east corner of the south deck to investigate the underlying construction.
- 5.3.4 The expert inserted moisture probes into bottom plates in walls beneath deck balustrades and recorded high moisture levels at the south east corner of the south deck, which he investigated further as outlined in paragraph 5.4.2. He also recorded
- 28% at the bottom of a clad entry column, below the north west corner of the entry deck balustrade above, and
  - 27% beside a west window sill beneath the south deck balustrade.
- 5.3.5 Without invasive investigation, the expert could not confirm the accuracy of the latter readings, but considered it possible that water was tracking down from the deck balustrade above. However, probe readings into the top of the associated balustrade framing were low, so further investigation would be needed.

### 5.4 The decks

- 5.4.1 The expert noted that the timber cappings to the entry and south decks had a fall of 5°, which accorded with the minimum shown in E2/AS1. Although the handrails were screw-fixed to the top of the cappings, the screws did not appear to penetrate the full thickness of the plates.
- 5.4.2 The expert also noted:
- handrails are supported by a steel frame with a continuous bottom section fixed to the timber cappings and the capping slope allows water to pond against the metal section
  - movement in the timber cappings has caused corner mitre joints to open and water ponding against the handrail support section can drain into the joints
  - moisture levels up to 43% were recorded in balustrade framing at the corners and investigation (see paragraph 5.3.3) revealed that the top plate was not flashed, with protection limited to building wrap
  - the expert considered that this could be the reason for some elevated moisture levels in lower walls below the balustrades, but further investigation is needed to confirm the cause(s).
- 5.5 The expert made the following additional comments:

- Although penetrations through the cladding are ‘not always neat’, plaster is tightly finished around pipe work and penetrations appear satisfactory.
- The north deck balustrade, flat timber capping, wall claddings and floor framing are original, with work under the first building consent limited to the installation of liquid-applied membrane and tiles. There is no evidence of moisture problems and the weathertightness of this deck appears satisfactory.
- In regard to the authority’s comments about the membrane at the south end of the south deck, this work was not undertaken under the first building consent as membranes were installed under the second consent in 2013.
- Although clearances from weatherboards to deck surfaces are below E2/AS1’s recommended 35mm in two locations (30mm at the entry deck and 15mm at the south deck), there is no evidence of associated moisture penetration. (I also note that the deck floors appear well drained away from the walls and the 15mm clearance is sheltered beneath generous eaves.)
- Although EIFS cladding terminated close to the paving in some areas, the cladding included a cavity, the floor level is well above the paving, the overlap to the concrete foundations was ‘considerably more’ than the minimum 50mm minimum and there was no evidence of moisture penetration.

## **5.6 Clause E3: Internal moisture wet area membranes**

- 5.6.1 The expert took non-invasive moisture readings of framing associated with the interior membranes and found no evidence of moisture penetration. He also noted that the final inspection record had noted that these had been inspected and passed as being installed correctly.

## **5.7 Clause F4: Safety from falling**

- 5.7.1 The expert noted that the internal staircase was original and had not been altered during the building work, with an email from the authority on 22 January 2004 agreeing that a handrail was therefore not required. The expert also observed that satisfactory barriers were installed at the top of the south retaining walls.
- 5.7.2 In regard to deck balustrades, the expert observed that handrail heights vary from 985mm to 1000mm and the gap between the handrail and timber capping is 112mm. At one end of the entry deck balustrade, the gap varies from 80mm to 115 due to the bevel-backed weatherboards to the wall and also to the balustrade end.
- 5.7.3 The expert considered the balustrade dimensions to be satisfactory, taking account of the following circumstances:
- When comparing dimensions with the Acceptable Solution; the lowest handrail is only 15mm below, the gap under the handrail is only 12mm greater and the gap at the end of the balustrade may allow a 100mm sphere to pass through, but with only millimetres to spare.
  - The bottom of the gap above the capping is some 850mm above the deck floor and unable to be reached by small children.
  - Access to decks is via bi-fold doors fixed at the top with spring-loaded bolts that are not reachable by small children.

## 5.8 Clause H1: Energy Efficiency

- 5.8.1 The expert noted that there were two gas water heaters on the east elevation, with exposed pipes on the outside of the wall cladding. The lack of pipe insulation did not comply with Clause H1.

## 6. The expert's addendum report

- 6.1 As noted in paragraph 4.5, the expert revisited the house on 1 August 2014 and provided an addendum report that was completed on 11 September 2014. The expert noted that his visit was to carry out invasive moisture testing and sampling to confirm opinions expressed in the first report, where invasive testing had been restricted and had 'severely limited the assessment process' (see paragraph 5.3.1).

- 6.2 The expert referred to the authority's concerns in regard to the state of timber framing beneath the front entry deck and the south garage deck, with inspectors sighting damaged timber during deck repairs under the second consent. The authority's photographs provided for the first report had been unclear, the architect and the builder had advised that no mould had been present in framing, and the expert was unable to remove linings during his original visits in May 2014.

### 6.3 Additional moisture investigations

- 6.3.1 The expert removed small sections of linings or claddings ("the cut-outs") from the following areas:

- the previously removed panel in the garage ceiling under the south deck, exposing the same framing as shown in the authority's photograph (cut-out 1)
- the top of the wall to the south-east corner of the garage where high moisture levels had been previously noted in the balustrade framing above (cut-out 2)
- beside the games<sup>6</sup> room west door sill beneath the south deck, where a very high moisture level was previously assumed to be a false negative due to metal interference between the moisture probe and sill flashing (cut-out 3)
- the upper EIFS cladding to the inner face of the front entry wall, below the entry deck balustrade (cut-out 4).

- 6.3.2 The expert took samples and observed the following:

- Cut-out 1 (garage ceiling): severe staining and apparent decay with
  - 23% in deck joists (sample 1 and sample 2)
  - 20% in solid blocking (sample 3)
  - 29% in plywood deck substrate.
- Cut -out 2 (garage upper wall): low moisture levels with no visible signs of timber damage (sample 4)
- Cut -out 3 (games room door sill): 22% in bottom plate with water stained timber and building wrap (sample 5)
- Cut -out 4 (front entry porch): 30% in wall framing with water stained timber and building wrap (sample 5 and sample 6)

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<sup>6</sup> Noted as the family room in the addendum report

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

6.3.3 The expert forwarded six timber samples and one building wrap sample to a testing laboratory for analysis and its report dated 7 August 2014 included the following (in summary):

- All samples had been exposed to moisture ‘inconsistent with sound building practice and/or weathertight design’ and ‘appropriate remediation’ is required.
- Preservative analysis indicated that timber samples were ‘most likely untreated radiata pine, or may have been LOSP-treated<sup>7</sup>’.
- Samples 1, 3 and 5 contained ‘suspected incipient brown rot and /or early soft rot’ and replacement is ‘typically recommended’ if there is any doubt about the extent of affected materials.
- Samples 2 and 4 contained ‘fungal growths but no structurally significant decay’, showing these ‘had been exposed to conditions very close to those conducive to decay’ and severe decay is possible in nearby timber.
- Sample 6 contains well-established decay likely to affect structural integrity and replacement is likely to be required.
- Sample 7 contained various mould spores.

6.4 The expert concluded that his invasive investigations confirmed that water had been penetrating into the framing for some time and the laboratory report confirmed that the timber is damaged. He noted that his previous assessment found that deck balustrades were not weathertight and his additional investigation revealed that moisture had entered the deck balustrades and damaged lower wall framing.

## 7. Compliance of the building work

7.1 I note that the original building consent 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 that consent. Section 436(3)(b)(i) of the transitional provisions of the current Act requires the authority to issue a code compliance certificate if it ‘is satisfied that the building work concerned complies with the building code that applied at the time the building consent was granted’.

7.2 In order to determine whether the authority correctly exercised its power in refusing to issue a code compliance certificate, I must consider whether the building work complies with the Building Code.

7.3 The following paragraphs consider the code compliance of the house. The first determination reached conclusions which were based on the evidence available at that time. I have now amended those conclusions to take account of the additional evidence provided by the expert’s invasive investigations and reported in his addendum report (see paragraph 6.3).

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<sup>7</sup> LOSP (Light organic solvent preservative)

## Matter 1: The external envelope

### 8. Weathertightness

8.1 The evaluation of building work for compliance with the Building Code and the risk factors considered in regards to weathertightness have been described in numerous previous determinations (for example, Determination 2004/01<sup>8</sup>).

#### 8.2 Weathertightness risk

8.2.1 This house has the following environmental and design features, which influence the weathertightness risk profile of the external building envelope:

##### Increasing risk

- the house is in a very high wind zone
- the altered house is 2-storeys high and complex in form
- there are enclosed decks with clad balustrades above lower walls
- the 2003 deck and wall framing is not treated to resist decay

##### Decreasing risk

- the wind zone is moderated by site contours and vegetation
- lower walls have monolithic cladding fixed over a cavity
- although upper level weatherboards are directly fixed to the framing, the cladding is generally sheltered by roof overhangs.

8.2.2 Using the E2/AS1 risk matrix to evaluate these features, the elevations are assessed as having a high to very 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 upper level weatherboards. However, this was not a requirement at the time of construction.

#### 8.3 Weathertightness performance

8.3.1 Taking account of the expert's report, most of the external envelope appears to have generally been constructed in accordance with good trade practice and applicable manufacturers' instructions at the time of construction. Although the main roof and wall claddings generally appear satisfactory, some areas have not been constructed in accordance with good trade practice which has allowed moisture penetration to damage timber framing in areas below.

8.3.2 Although EIFS cladding to the lower walls appeared visually satisfactory, the expert's additional invasive investigations revealed that moisture has been penetrating via associated junctions and elements into the untreated timber framing and has caused damage which is not visible on plaster surfaces. Removal of claddings and linings revealed some of that damage but I consider that other areas associated with at-risk features are likely to be in similar condition.

8.3.3 It is clear from the expert's report that the deck balustrades as installed are unsatisfactory in terms of their weathertightness performance, which has resulted in moisture penetration and timber damage in some areas. It is also clear that past moisture penetration through the deck floors prior to recent deck repairs resulted in

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<sup>8</sup> Determination 2004/01 Refusal of a code compliance certificate for a building with a "monolithic" cladding system: House 1

significant timber damage, with current moisture levels indicating that moisture is still penetrating into the deck framing.

- 8.3.4 Taking account of the expert's two reports, I conclude that the areas outlined below require attention, but I stress that this list may not yet be complete. I consider that further investigation and/or remedial work is necessary in respect of the following:
- the handrail support frame allowing water to pond on the timber cappings and the open mitre joints, with high moisture levels recorded in the framing
  - the lack of flashings to protect the top of the balustrade framing
  - for areas investigated by the expert, exposure of damaged framing to determine the full extent of damage
  - for other areas not yet investigated, additional invasive moisture testing of wall and deck framing, with investigation of timber condition should high moisture levels be found.
- 8.3.5 Considerable work is required to make the building envelope weathertight and durable and to ensure that timber framing is adequate. Further investigation is necessary, including the systematic survey of all risk locations. Such a survey will need to incorporate further invasive moisture and sample testing and the exposure of framing where necessary in order to fully determine the extent of past and present moisture penetration, timber damage and the repairs now required.

## **8.4 Weathertightness conclusion**

- 8.4.1 I consider the expert's reports establish that the building envelope is not adequate because there is evidence of moisture penetration and timber decay. Consequently, I am not satisfied that the external building envelope currently complies with Clause E2 of the Building Code. Because of uncertainty as to the extent and significance of damage to the untreated timber framing, I also cannot be satisfied that the house complies with Clause B1 of the Building Code.
- 8.4.2 In addition, the building envelope is also required to comply with the durability requirements of Clause B2. Clause B2 requires that a building continues to satisfy all the objectives of the Building Code throughout its effective life; the cladding systems are required to satisfy Clause E2 for a minimum of 15 years, however the expected life of the framing is a minimum of 50 years. Careful attention to the performance of the external envelope is needed to ensure that it continues to protect the underlying structure for its minimum required life of 50 years. Because the cladding faults are likely to allow the ingress of moisture in the future, the building work does not comply with the durability requirements of Clause B2
- 8.4.3 I consider that final decisions on whether code compliance can be achieved by either remediation or re-cladding, or a combination of both, can only be made after a more thorough investigation of the claddings and the condition of the underlying timber framing. This will require a careful analysis by an appropriately qualified expert, and must include a full invasive investigation of the extent, level and significance of the moisture levels and timber decay to the framing. Once that decision is made, the chosen remedial option should be submitted to the authority for its approval.
- 8.4.4 I note that the Ministry has produced guidance documents on weathertightness remediation, which will assist the owner in understanding the issues and processes involved in remediation work to the building, and in exploring various options that may be available when considering the upcoming work required.

## Matter 2: The remaining Building Code clauses

### 9. Discussion

- 9.1 I acknowledge the expert's comments in regard to the authority's concerns about the north deck and the internal stairs. I note that those elements were not part of the building work carried out under the first consent and are not considered in this determination.
- 9.2 I also note the expert's comments on the exterior gas water heaters and consider that the lack of insulation to the exposed pipe work does not comply with Clause H1.
- 9.3 Taking account of the expert's report, I am satisfied that other relevant items identified by the authority are adequate in the circumstances. In particular:
- the shower areas comply with Clause E3 (see paragraph 5.6)
  - the barriers to the exterior retaining wall comply with Clause F4.
- 9.4 In relation to the balustrades to the roof deck additions (see paragraph 5.7.3), I consider the balustrades comply with F4 with the exception of the 85 to 115mm gap between the ends of the balustrade to the western deck and the wall cladding as the gap will allow a 100mm sphere to pass through it.

### 10. The durability considerations

- 10.1 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).
- 10.2 In many previous determinations I have taken the view that a modification of this requirement can be granted if I can be satisfied that the building complied with the durability requirements at a date earlier than the date of issue of the code compliance certificate, that is agreed to by the parties and that, if there are matters that are required to be fixed, they are discrete in nature.
- 10.3 However, because of the extent of further investigation required into the condition of the timber framing and therefore the structure of the house, and the potential impact of such an investigation on the external envelope, I am not satisfied that there is sufficient information on which to make a decision about this matter at this time.

### 11. What happens next?

- 11.1 A notice to fix should be issued that requires the owner to bring the alterations into compliance with the Building Code, identifying the areas and investigations listed in paragraphs 8.3.4 and 9.2 and referring to any further defects that might be discovered in the course of investigation and rectification.
- 11.2 I suggest that the parties adopt the following process to meet the requirements of paragraph 11.1. Initially, the authority should issue the notice to fix. The applicant should then produce a response to this in the form of a detailed proposal for the house as to the rectification or otherwise of the specified matters. That proposal should be produced in conjunction with a competent person with suitable experience in weathertightness remediation. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

## 12. The decision

12.1 In accordance with section 188 of the Building Act 2004, I hereby determine that:

- the wall and deck framing of the alterations does not comply with Building Code Clauses B1 and B2
- the exterior building envelope of the alterations does not comply with Building Code Clauses B2 and E2
- the water heater pipes do not comply with Building Code Clause H1
- the gaps at the ends of the balustrade to the western deck do not comply with Building Code Clause F4

and accordingly, I confirm the authority's refusal to issue a code compliance certificate.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 7 October 2014.

John Gardiner  
**Manager Determinations and Assurance**