



## Determination 2014/041

### Regarding the refusal to issue a code compliance certificate for an 18-year-old house reclad with monolithic cladding at 8 Silkwood Grove, Totara Heights, Manukau



#### 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 Chen (“the applicant”)
- Auckland Council (“the authority”)<sup>2</sup>, carrying out its duties as a territorial authority or building consent authority.

#### 1.3 The reasons for this determination

1.3.1 The application for this determination arises from the following:

- The house was constructed under a building consent issued in 1995 (“the original building consent”) and was substantially completed in 1996; final inspections were not carried out until 1998. No code compliance certificate has been issued for the building work.
- The original monolithic cladding developed moisture ingress problems shortly after completion and investigations in 2003 identified cladding defects and recommended that the wall cladding be replaced with a system that incorporated a drained cavity.

<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> Before the application was made, Manukau City Council was transitioned into Auckland Council; the term “the authority” is used for both.

- A new building consent was issued in 2004 (“the recladding consent”) to remove and replace the original cladding. That work was completed in early 2005 and the authority issued a code compliance certificate for the recladding consent in late 2006. The original building consent remained unresolved and the applicant purchased the house in 2013.
- The authority refused to issue a code compliance certificate for the original building consent because it is not satisfied that the building work complies with certain clauses<sup>3</sup> of the Building Code (First Schedule, Building Regulations 1992), particularly in regard to weathertightness.

1.4 The matter to be determined<sup>4</sup> is whether the authority was correct in its decision to refuse to issue a code compliance certificate for the original building consent. In deciding this matter, I have also taken into account the building work included in the 2004 recladding consent which now forms part of the external building envelope, insofar as it relates to the ongoing compliance of the building work carried out under the original building consent.

1.5 I have therefore considered whether the external building envelope of the house as it now exists 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 monolithic cladding, the windows, the roofing, the parapets, the deck and the flashings), as well as the way the components have been installed and work together. Included in the matter is the other concern raised by the authority regarding Building Code Clause F4 Safety from falling (refer paragraph 3.9.2).

## 1.6 Matters outside this determination

1.6.1 As mentioned above, in considering the external envelope of this house I must take into account components and junctions added or altered as part of the 2004 recladding consent. The application for determination was limited to the original building consent; the code compliance certificate issued for the 2004 recladding is therefore not included in this determination.

1.6.2 I also note that the owner may apply to the authority for a modification of the durability provisions for the 18-year-old house to allow the specified periods to commence from the date of substantial completion in 1996. Although I comment on this in paragraph 8, I leave it to the parties to resolve in due course.

## 1.7 The evidence

1.7.1 This determination refers to reports, correspondence, and statements from a variety of consultants, architects, building surveyors and the like. Those entities are described herein as:

- the architect engaged by the original owner to provide an initial sketch design of the house (“the original architect”)
- the draughting company engaged by the original owner to produce detailed consent drawings and specifications (“the draughting company”)
- the consultant engaged by the builder to inspect and advise on the original stucco cladding (“the plaster consultant”)

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

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

- the building surveyor engaged by the second owner of the house to investigate moisture penetration into the house (“the building surveyor”)
- the architect engaged by the builder to comment on the building surveyor’s reports, recommendations and implications (the builder’s consultant”)
- the company engaged by the second owner to design and oversee the 2004 recladding consent (“the recladding architect”)
- the expert commissioned by the Ministry to advise on this dispute (“the expert”).

1.7.2 In making my decision I have considered the submissions of the parties, the above reports, and the other evidence in this matter.

## **2. The building work**

2.1 The building work consists of a detached house which is two-storeys-high in part and is situated on a sloping site in a high wind zone<sup>5</sup> for the purposes of NZS 3604<sup>6</sup>. The drawings take the garage door and entry courtyard as east-facing and this determination follows that convention. The house is complex in plan and form and is assessed as having a high weathertightness risk.

2.2 Construction is generally conventional light timber frame, with reinforced concrete foundations and floor slab, concrete block retaining walls and monolithic cladding. The floor slab is stepped to suit the slope of the site, with part-height concrete block retaining walls accommodating three changes in level. The south walls are set into the slope of the site, with retaining walls beneath the timber framing.

2.3 Most exterior walls rise to form roof parapets, with low-pitched pressed metal roofing that falls to membrane-lined internal gutters at the perimeter. Three walls rise to form monolithic-clad balustrades to a small deck above the breakfast room, which extends to the east from the upper level master bedroom.

2.4 The expert forwarded seven framing samples to a testing laboratory for analysis, which reported that preservative analysis suggested that timber samples were boricon-treated to a level equivalent to H1.2.

### **2.5 The exterior walls**

2.5.1 Prior to replacement, the original stucco cladding consisted of fibre-cement sheets fixed directly through the building wrap to the framing and covered by a slip layer of building wrap, metal-reinforced solid plaster and a flexible paint coating. Windows and doors were recessed, with plastered sills and reveals.

2.5.2 The cladding installed under the 2004 recladding consent was a similar stucco system, except that the fibre-cement backing sheets were fixed through 20mm timber cavity battens and the building wrap to the framing. The original windows and doors were retained, with new flashings added to the junctions.

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<sup>5</sup> According to the engineer’s bracing calculations

<sup>6</sup> New Zealand Standard NZS 3604:1999 Timber Framed Buildings

## **2.7 The windows and doors**

- 2.7.1 On the east elevation, a paved area extends from the breakfast room to the driveway. Further paving on the west elevation forms a terrace that opens from the living areas. Full height windows and doors to these areas are cedar, together with the south windows to the breakfast room. The remaining joinery is aluminium.
- 2.7.2 The recladding drawings show aluminium joinery flanges in line with the front of the cavity and new metal flashings installed. Anti-capillary gaps and drip edges are shown at window heads and metal sill trays bridge the cavities to drain to the outside. Air seals are shown and the specification states:
- Form an air-tight seal by means of proprietary expanding foam, compressible foam strips, or sealants used with backing rods, applied deep within the reveal to completely fill the gap between joinery and structural framing. Ensure that in combination with the internal linings a complete air seal is created.
- 2.7.3 The recladding drawings show timber door and window frames installed with interior linings notched into the window frame and no air seals. Except where replacement of decayed framing necessitated removal, it appears that timber joinery was left in place during the recladding work, with new timber sills and metal head and jamb flashings added. The specification is silent on alterations to the timber joinery.

## **3. Background**

- 3.1 The original owners engaged the original architect to provide an initial sketch design followed by a draughting company to provide consent documentation for the house; a building consent was then applied for in August 1995. The owners then sought quotations for construction; accepting a separate quote dated 26 September 1995 from the plasterer and a quote dated 3 October 1995 from the builder; the latter including a provisional allowance for the stucco, with no allowance for exterior paintwork or deck tiling.
- 3.2 The authority issued building consent No. 95/4004 for the house on 6 October 1995 under the Building Act 1991 (“the former Act”), and carried out various inspections during construction, including pre-line and post-line during February and March 1996. The stucco was apparently completed in May 1996 but no stucco inspections are recorded.

### **3.3 Post-occupancy leaks**

- 3.3.1 It appears that the unfinished house was occupied before August 1996 as, in a facsimile to the builder on 21 August 1996 the owners raised concerns about ‘water seeping into the house in a number of areas’ particularly around the cedar joinery.
- 3.3.2 The builder responded on 3 September 1996 expressing his concerns about the quality of work done by the plasterer chosen by the owners and noting that his concerns had been supported by BRANZ inspectors who looked at the work. The builder was also concerned that the plaster remained unpainted ‘some four months’ after installation and highlighted the owners’ choice not to install parapet cappings.
- 3.3.3 Further correspondence followed between the owner and the builder in regard to plaster defects, parapet cappings, paint coatings, and disputes about reasons and responsibilities for the leaks. The builder engaged a specialist plaster consultant who inspected the plaster and in a report dated 20 November 1996 advised on remedial work in the form of crack repairs, the addition of control joints, and the completion of exterior paintwork.

- 3.3.4 It appears that some remedial work was carried out and painting and landscaping completed over the next few years. The authority carried out final inspections of the house on 23 November 1998 and the handwritten inspection summary ticks all items as complying except for a handrail missing from the main staircase.
- 3.3.5 There is no specific re-inspection record, but the computer-generated inspection history notes a 'pass' on 24 April 2001 and states 'Interim CCC issued'. Although I have not seen it, the building surveyor sighted a copy of the interim code compliance certificate (see paragraph 3.4.5). The date of issue indicates it was sought when the house was offered for sale in 2001. The second owner purchased the property from the original owners in August 2001.

### **3.4 The building surveyor's reports**

- 3.4.1 After moisture problems in one area became apparent, the second owner engaged a building surveyor to undertake an initial inspection and identify potential weathertightness issues. The surveyor inspected the house on 24 June 2003 and provided an initial report dated 16 July 2003.
- 3.4.2 The building surveyor separated his investigation into the following:
- The roof, including the roof and deck balustrade parapets.
  - Penetrations.
  - Windows and doors.
  - Cladding clearances.
- 3.4.3 The building surveyor noted various areas that had potential for moisture penetration and considered that moisture was likely to be entering into the framing and that decay was likely. He concluded that further investigation was needed, including invasive moisture testing and removal of cladding areas to determine the extent of moisture penetration and timber damage, and the level of repairs needed.
- 3.4.4 The surveyor re-visited the house on 21 July 2003 to undertake further investigation as recommended in his first report. The surveyor's report dated 28 August 2003 provided the results of extensive invasive moisture testing, drilling and probing framing timber, and the removal of four panels of cladding to view the framing.
- 3.4.5 The building surveyor assessed all documentation provided by the owner and on the authority's property file, noting:
- The Interim Code Compliance Certificate was issued on 24 April 2001 and required that a handrail be installed to the lounge side of the internal staircase to achieve full compliance.
- 3.4.6 The expert took 58 invasive moisture readings into the framing, with only one reading recorded as less than 18%. 45 readings were 30% or higher, with 20 of these 40% or higher; indicating significant moisture penetration into the framing. Most of the highest readings were associated with joinery junctions, with others in bottom plates, the upper deck and below parapets. The removal of cladding panels revealed timber decay.
- 3.4.7 The building surveyor identified various defects in the cladding, including
- the lack of or incorrectly installed joinery flashings
  - the lack of cappings to roof parapets and the deck balustrade
  - unsealed penetrations through the cladding

- the lack of a watertight deck membrane
- the lack of cladding clearance at ground level.

#### 3.4.8 The building surveyor's recommended repair solution was to

...remove decayed timber and then to provide a dry environment for the timber framing by way of installing a drained and ventilated cavity to the external walls of this house. Where insufficient ground clearance has been provided concrete nibs have been recommended to lift the bottom plate framing timbers the required height above surrounding ground or paving levels. A robust treatment of windows, with head, jamb and sill tray flashings together with air seals have been recommended to be integrated into the drained and ventilated cavity system.

### 3.5 Response from the builder's consultant

3.5.1 It appears that a statement of claim was made against the builder who, via his solicitor, engaged a consultant to provide advice on the dispute with regard to allocating responsibility for defects. The builder's consultant reviewed the building surveyor's findings and provided a detailed report dated 20 July 2004.

3.5.2 The consultant made some comments that I consider pertinent to understanding the background to this determination, including (in summary):

- Deck tiling was undertaken separately after the builder left the site as it was not part of the contract, with unknown protection of the membrane prior to tiling.
- The builder had advised metal cappings for all parapets but the original owners would not accept these on aesthetic grounds.
- The builder had not approved the quality of the plasterer's work but the owners had taken over the subcontract and paid the plasterer directly, with stucco completed after the builder left the site.
- In his quote, the builder had allowed for metal flashings around all joinery but the original owners would not accept these on aesthetic grounds.
- The consent details show a sill flashing embedded in the plaster, which would have directed moisture into the framing rather than to the outside.
- Paving and other landscaping work was not part of the contract and was carried out after the builder left the site. A break in the stucco had been detailed in the consent drawings but this was not installed and was not noted by the authority.
- High moisture readings and damage to the framing have resulted from the owners' decisions to omit joinery and parapet flashings, and from the owners' separate contracts for tiling, landscaping and plastering.

3.5.3 In a subsequent letter dated 18 October 2004, the builder's architect added the following comments on other parties involved with the house (in summary):

- The original architect provided a preliminary design only, which was limited to room layouts and 'basic elevations'. These were developed by the draughting company into detailed drawings and specifications for the building consent.
- The detailed consent documents had a number of faults, including
  - membrane flashings under the plaster, which would direct moisture into the framing
  - vulnerable junctions dependent only on sealants

- no control joints shown on elevations
- lack of specific information about cladding clearances
- a generic specification with insufficient specific information.
- The authority issued the building consent despite shortcomings in the documents and inspected the house during construction, with no questions raised about the stucco cladding.
- The painting was arranged by the original owners, despite this being a critical weatherproofing aspect of any stucco system.

### **3.6 The recladding consent**

- 3.6.1 Consent documentation was prepared for recladding the house and the authority issued the recladding consent (No. 044379) under the former Act on 3 December 2004. Construction started in January 2005, with the recladding architect overseeing removal of the original cladding and the decayed framing.
- 3.6.2 The recladding architect provided the authority with photographs of all exposed decayed timber and confirmed that all damaged timber had been ‘removed up to one metre past the decay’. However, the authority did not appear to inspect framing replacement and timber decay sampling; recording its first ‘part inspection’ on 18 February 2005, with two to three inspections per month of cavities, backing sheets, flashings and mesh until June 2005.
- 3.6.3 The original builder and his consultant visited the site in March and May to view the remedial work and a letter from the consultant dated 29 June 2005 noted that ‘most of the existing timber from the original construction was still in place, indicating that it had not been damaged from leaking.’ Replaced areas of framing appeared ‘very restricted in their location’ and there was no sign of timber deterioration around the deck. The builder’s consultant concluded that the two inspections indicated ‘that there was very limited water ingress damage to the property’.
- 3.6.4 No further inspections are recorded until the first final inspection on 23 March 2006; the authority’s record identified five items to be attended to. The authority re-inspected the work on 29 June and 13 July 2006, passing all items as complete. The authority issued a code compliance certificate dated 28 December 2006 for the recladding consent.
- 3.7 The house sold again in 2007 and again in 2009, with no further correspondence until the applicant purchased the property in March 2013 and noted from the LIM report that the original building consent lacked a code compliance certificate. The applicant then approached the authority with the aim of resolving the matter.

### **3.8 The 2013 final inspections**

- 3.8.1 The authority carried out final inspections during September 2013, with the plumbing inspection passed on 19 September 2013. The final building inspection on 17 September 2013 identified cladding defects and other outstanding items, noting:
- Cannot recommend issue of CCC / Historical consent with weathertightness issues / Recommend durability team review.
- 3.8.2 Re-inspections were carried out in November 2013. The entry in the authority’s inspection summary dated 4 November 2013 notes ‘final inspection approved’, but adds ‘can proceed to CCC audit review when all relevant support documentation has been received, checked & accepted.’ The last inspection dated 13 November 2013 is

named as a 'pass CCC Audit' and notes 'pass<sup>7</sup> CCC audit with a decision NOT to recommend issue of CCC at this stage' and adds:

Reason: Potential weathertightness issues identified at final inspection – refer photos of cracked and repaired cladding. The cladding was replaced in 2004 under consent 044379 which has a CCC.

Outcome: Recommend a review is undertaken by [the authority's] specialist durability team before progressing further.

### **3.9 The authority's refusal to issue a code compliance certificate**

3.9.1 It appears that another inspection was carried out on 26 November 2013 and the authority wrote to the applicant on 29 November 2013 to advise that a code compliance certificate could not be issued, stating:

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.

3.9.2 The authority noted that its 'areas of concern' included, but were not limited to:

1. Internal stairwell barrier does not comply with the building code ie; gaps between barrier railings exceed 100mm.
2. An amount of remedial work has been identified during the inspection process. Front entry hallway ceiling, master bedroom walk in wardrobe ceiling. The owner has indicated that water has previously entered the dwelling at these locations. An attempt to stem the flow of water has been made by the owner's father to these locations. The water ingress may have had an effect on the structural elements to the consented works. The owner has also indicated the water ingress has been evident to the kitchen floor which appears to be entering from the exterior wall due to the ground heights at this location ie; FGL higher than FFL.
3. Higher than normal moisture readings were taken during the inspection. Front entry hallway and kitchen exterior wall.

3.9.3 The authority instructed the applicant not to 'commence any remedial work until approved' and recommended that

... you engage the services of a suitably qualified individual 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 [the authority] for further review.

3.10 The Ministry received an application for a determination on 24 February 2014.

## **4. The submissions**

### **4.1 The applicant's submission**

4.1.1 In a statement dated 16 February 2014, the applicant disagreed with the authority's refusal to issue a code compliance certificate for two reasons: first, the final inspection was completed and second, the entire house was reclad in 2004 and a code compliance certificate issued for the work which included a cavity behind the cladding. The applicant concluded:

In our view the house is fine and meets the building code requirements for a CCC. Even though there was water leakage when we moved in as described in [the

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<sup>7</sup> I take this as referring to the name of the inspection, rather than to a 'pass' of the inspection



authority's] section 95A letter, but that was due to blocked gutter. After we cleaned the gutter we never had the problem again.

4.1.2 The applicant forwarded copies of:

- an incomplete set of the original consent drawings
- the letter from the authority dated 26 November 2013
- the authority's computer record of the inspection summary
- a CD-Rom containing other drawings and documents in the authority's property file, as outlined below.

## **4.2 The authority's submission**

4.2.1 The authority forwarded a CD-Rom, entitled 'Property File', which contained some additional documents pertinent to this determination including:

- incomplete drawings and specifications for the original building consent
- the original building consent
- the original inspection summary
- the plaster consultant's 1996 report
- the building surveyor's 2003 weathertightness reports
- the builder's consultant's 2004/2005 reports
- consent documentation for the 2004 recladding consent
- the inspection summary for the recladding work
- the code compliance certificate for the 2004 recladding consent
- various producer statements, warranties, photographs and other information.

## **4.3 The draft determination and submissions in response**

4.3.1 A draft determination was issued to the parties for comment on 9 June 2014.

4.3.2 The authority initially responded on 16 June 2014 accepting the draft without further comment.

4.3.3 A second response from the authority was received on 23 June 2014, in which the authority did not accept the draft. The draft determination had provided commentary regarding notices to fix in respect of building work carried out by a previous owner and the authority provided a submission on that issue.

4.3.4 The applicant accepted the draft without further comment in a response received on 26 June 2014.

4.3.5 On 19 August 2014 I received a further email from the authority that included legal advice the authority had received regarding the commentary on notices to fix in the draft determination. That advice noted that the discussion on notices to fix was outside the matter to be determined.

4.3.6 There has been no indication that the authority proposes to issue a notice to fix and I accept that the discussion in the draft regarding such a notice is outside the scope of the matter to be determined. The determination has been amended accordingly.

## **5. Grounds for the establishment of code compliance**

- 5.1 In order for me to form a view on the code compliance of those elements in this house that remain from the building work carried out under the original building consent I must consider the performance and therefore the compliance of the exterior building envelope as it now exists.
- 5.2 The code compliance of the remaining original elements is in part dependent on the weathertightness and durability of the stucco cladding system installed under the 2004 recladding, because that cladding must protect those elements. The current exterior building envelope is also made up of some remaining original elements which cannot be separated from the more recent components. Examples of that interdependence include the 2004 replacement framing within the exterior timber framing and the original joinery left in place or reused during the recladding work.
- 5.3 In summary, I find that the following evidence relating to the original building consent and the recladding consent will allow me to form a view as to the code compliance of the building work as a whole:
- The drawings and other technical information.
  - The records of inspections undertaken by the authority.
  - The various reports on investigations into the original building work.
  - Photographs taken during the recladding work.
  - The expert's report on the exterior building envelope as outlined below.

## **6. The expert's report**

- 6.1 As mentioned in paragraph 1.7, I engaged an independent expert to assist me. The expert is a member of the New Zealand Institute of Building Surveyors and inspected the house on 19 March and 4 April 2014, providing a report completed on 7 May 2014. The expert noted that his inspection focused on the concerns and locations highlighted by the authority.

### **6.2 General**

- 6.2.1 The expert reviewed the authority's property records and outlined the history of the house to establish the scope of work completed under the 2004 recladding consent, noting that the extent of decayed framing replaced was not documented in the authority's records. However, photographs taken during recladding (see paragraph 3.6.2) indicate that decay was widespread and likely to have resulted in extensive replacement with H1.2 framing.
- 6.2.2 The expert noted that the following appeared to relate to the original consent:
- The profiled metal roof cladding, with some replaced fixings and flashings.
  - The curved uPVC roof over the central hallway.
  - Most areas of the butyl rubber lined internal gutters.
  - Masonry retaining walls and tanking membranes.
  - Timber and aluminium joinery retained or reused with new flashings.
  - Interior linings and trim.

- Exterior masonry walls, paving and driveway.
- 6.2.3 Excluding items installed as part of the 2004 recladding consent, the expert noted that variations from the original consent drawings included:
- channel drain at garage opening omitted
  - open metal deck balustrade replaced with clad balustrade
  - pergola to east elevation omitted
  - roof pitches reduced
  - fibre-cement sheet protection to retaining wall tanking membrane omitted.
- 6.2.4 The expert also noted that variations from the 2004 recladding consent drawings and specifications included:
- air seals to joinery perimeters omitted
  - falls to recessed sill flashings reduced
  - stucco/timber jamb junction changed, with timber bead not overlapping plaster
  - uPVC pipe used for deck overflows in lieu of continuous membrane
  - cladding clearances reduced.

### 6.3 Destructive investigations

- 6.3.1 The expert inspected the interior, observing evidence of moisture damage at eight locations. The expert investigated these locations by removing small sections of cladding (“the cut-outs”) and taking invasive moisture readings from the exposed framing and water tested some junctions using dyed water. The expert took seven timber samples for analysis and results of investigations are summarised in Table 1:

**Table 1:**

	Location	Surface damage	At Cut-outs <sup>8</sup>	Timber samples
1	Breakfast room skirting at south retaining wall	Flaking paint, swollen skirtings, damaged linings	Dye-testing of concrete retaining wall resulted in water penetrating through to the timber strapping (above 24%)	<b>Sample 1:</b> Soft rot. Growth of <i>Stachybotrys</i> mould
2	Timber sill/jamb junction above location 1	Damaged linings	Dye-testing exterior sill/ jamb junction showed water draining down the back of the timber sill. No air seals visible.	<b>Sample 2:</b> Well established decay – pockets of early soft rot. Spores of <i>Stachybotrys</i>
3	Bottom plate of column in kitchen wall below upper wall	Flaking paint, swollen skirtings, damaged linings	No evidence of moisture penetration (below 18%). Damage attributed to a past plumbing leak which has since been repaired.	<b>Sample 3:</b> Fungal growths but no significant decay. Spores of <i>Stachybotrys</i>
4	West timber sill/jamb junction sill adjacent to hallway steps down to garage	Flaking paint, swollen skirtings, damaged linings	Dye-testing exterior sill/ jamb junction showed no moisture entry through junction. Wall void below timber sill – visible damage to building wrap beside stepped cladding (18% to 23%)	<b>Sample 4:</b> Soft rot. Growth of <i>Stachybotrys</i> mould

<sup>8</sup> Invasive moisture readings shown in brackets

	Location	Surface damage	At Cut-outs <sup>8</sup>	Timber samples
5	Bottom of garage door jambs	Flaking paint, swollen skirtings, damaged linings	Concrete nib under garage framing but not to adjacent hallway framing. Visible mould (just over 18%)	<b>Sample 5:</b> Fungal growths – superficial soft rot.
6	Bottom plate beside family room north timber doors	Flaking paint, swollen skirtings, damaged linings	Moisture under 18% but die-testing exterior sill/ jamb junction resulted in water entering floor slab rebate. No air seals visible.	<b>Sample 6:</b> Well established advanced decay likely to cause loss of bulk of original structural integrity.
7	Ceiling void to entry hallway	Patched ceiling repairs below internal gutter above hallway	Area below previously blocked and leaking internal gutter. Additional flashings were installed. Boroscope via removed downlight – no signs of moisture entry/damage.	No sample taken.
8	Southeast corner of upper wardrobe under roof parapet	Flaking paint, swollen skirtings, damaged linings Patched ceiling repairs	No current moisture penetration but obvious signs of significant past moisture penetration (below 18%). Most timber damage appears to be the result of original defects in the parapets above.	<b>Sample 7:</b> Well established early to advanced decay – likely to cause loss of structural integrity. Spores of <i>Stachybotrys</i>

6.3.2 Although moisture levels below 18% generally indicate that moisture has not entered the structure, I note that the expert's inspection followed a long period of dry weather and moisture levels would rise during wetter seasons and result in signs of moisture damage such as those observed by the expert and confirmed by timber sample testing.

6.3.3 The laboratory report dated 16 April 2014 noted that preservative analysis suggested that timber samples taken from exterior framing were treated with boron to a level equivalent to H1.2. I also note that the laboratory tests detected no treatment of the interior timber strapping to the masonry retaining wall in sample 1.

6.3.4 Although structurally significant decay was detected only in samples 6 and 7, fungal growths and/or superficial decay in other samples could be on the periphery of more seriously affected framing. It is important to establish the limits of fungal infection and/or decay, and to establish the causes, and apply appropriate remediation. The laboratory report concluded that:

The fungal morphology, its distribution and the fungal and decay types identified suggested that all of the samples examined had been exposed to moisture conditions that are inconsistent with sound building practice and/or weathertight design and that appropriate remediation is needed to correct this.

## 6.4 Windows and doors

6.4.1 The expert assessed the timber and aluminium joinery and, taking account of his destructive investigation (see Table 1), noted:

- head flashings and sill flashings are visible
- where linings were removed from two locations, no air seals had been installed
- falls to sill flashings are limited, and in one case the fall is negative
- there are numerous cracks between the stucco and window jambs which provide a clear path for moisture to enter the junction

- it is likely that the timber joinery was left in place during recladding and it is not clear from the details where underlying jamb flashings terminate
- the above, together with cracks and the lack of air seals would allow moisture to be sucked into the junction and past any jamb flashings – as demonstrated by the water testing of these junctions.

## **6.5 The retaining walls**

6.5.1 The expert noted that external walls include a number of masonry retaining walls – below window sills to the south elevation and at the level change beside the garage. Retaining walls are coated with liquid-applied membrane on the outside and are strapped and lined on the interior.

6.5.2 The expert observed that damp proofing was not protected with fibre-cement sheets as specified in the consent documents. Water testing the retaining wall, the expert noted that moisture penetrated the wall and was absorbed into the timber strapping.

## **6.6 Cladding and floor clearances**

6.6.1 The recladding consent called for ground and paving levels to comply with NZS 3604, but many areas do not meet the minimum recommendations, including:

- the west wall to the entrance hallway and the south wall to the garage, where stucco butts against soil and blocks the drained cavities
- cladding beside the garage door and the bottom plate adjacent to the garage
- the north and west elevations of the lounge/dining areas
- the southeast corner
- the north and east elevations of the family and breakfast areas.

6.6.2 The drainage channel in front of the garage door shown in the drawings was not installed and, although a concrete nib lifts the garage framing and the bottom plate, the cladding is less than 50mm above the driveway paving.

## **6.7 Gutter repairs**

6.7.1 The expert noted that internal gutters had been recently cleared of leaf debris from nearby trees that had since been removed. Blockages to internal gutters above the entry hallway had resulted in the gutter overflowing into the hallway, but additional flashings had since been installed and there appeared to be no current moisture penetration (refer Table 1 location 7).

6.7.2 Although blockages had also occurred above the upper level wardrobe, the expert considered most damage to be historic as a result of defective parapets. Sample testing indicated that significant damage to framing had resulted from moisture penetration over a long period of time (refer Table 1 location 8).

## **6.8 Outcome**

6.8.1 Including the defects described above and commenting on other defects with potential for moisture penetration, the expert noted that

- historic decay resulting from defects in the original cladding requires further investigation to establish the condition of other areas of the original framing

- timber joinery jambs are not weathertight, with cracks at junctions and no air seals installed allowing water to penetrate in some areas
  - the membrane to the exterior of retaining walls is not protected and water is penetrating the concrete where the membrane is damaged in some areas
  - there is insufficient clearance to the ground or paving from internal floor levels and the bottom of the cladding at many areas
  - cracks to the stucco around control joints and some other areas require repair to prevent undue moisture penetration into the cavity
  - overflow outlets to internal gutters are not installed as detailed and the sectional uPVC pipe used has a gap that may allow moisture to penetrate
  - the gutter membrane is not fully dressed up the sides of scupper outlets and has pulled away in some areas, exposing the side of adjacent cladding
  - where the cladding base steps to follow changes in foundation levels, a perforated strip closes the vertical edge of the cladding, which allows moisture into the cavity and is the likely cause of moisture damage (refer Table 1 location 4).
- 6.8.2 Although drawings call for saddle flashings behind parapet capping to wall junctions to allow moisture entering the junction to drain into the cavity and to the outside at the base of the cladding, the expert could not confirm these had been installed.
- 6.8.3 The expert noted that his investigation had identified three areas of confirmed established decay damage resulting in the loss of structural integrity of the framing, which appeared to result from early moisture penetration through defects in the original cladding. That decay was not identified and replaced as part of the 2004 recladding and the expert considered that further areas of decay remaining from original cladding defects were likely.
- 6.8.4 Taking account of the decayed framing, the expert concluded that the external building envelope fails to comply with Building Code Clauses B1, E2 and B2.
- 6.8.5 The expert also noted that openings to the internal stair balustrade were 140mm wide, which did not comply with the provisions of Clause F4 Safety from falling.
- 6.9 A copy of the report was forwarded to the parties on 14 May 2014.

## **7. Compliance**

### **7.1 The claddings**

- 7.1.1 It is clear from the expert's report that the building envelope as it now exists remains unsatisfactory in terms of its weathertightness performance, which has resulted in moisture penetration and timber damage. Taking into account the expert's report and his limited investigations, I conclude that the investigations and areas outlined in paragraph 6.8.1 require attention, but I note that this list may not yet be complete.
- 7.1.2 In order for a code compliance certificate to be obtained for the original building work, further work would be required to make the building envelope weathertight and durable and to protect the underlying framing. Further investigation is necessary, including the systematic survey of all risk locations. Such a survey will need to incorporate 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.

- 7.1.3 I consider the expert's report establishes that the current performance of the building envelope is not adequate because there is evidence of moisture penetration and decay in some areas of the timber framing. Consequently, I am satisfied that the house does not comply with Clauses B1 and E2 of the Building Code
- 7.1.4 In addition, the building envelope is also required to comply with the durability requirements of Clause B2. The present cladding systems are required to satisfy Clause E2 for a minimum of 15 years under Clause B2.3.1. However, the expected life of the building itself 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 cladding faults are likely to allow the ingress of moisture in the future, the house does not comply with the durability requirements of Clause B2.
- 7.1.5 Because the identified faults occur in discrete areas, I am able to conclude that satisfactory investigation and rectification of items outlined in paragraph 6.8 is likely to result in the current building envelope being brought into compliance with Clause B2 of the Building Code.
- 7.1.6 I accept the observation of the expert in respect of the internal stair balustrade and conclude that it does not comply with Clause F4.

## **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 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.
- 8.3 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.

## **9. Discussion**

- 9.1 It is now for the applicant to decide whether they wish to undertake the investigation and building work required in order to obtain a code compliance certificate for the original building consent. I strongly suggest that the applicant consider engaging a competent person with suitable experience in weathertightness remediation if they do wish to obtain a code compliance certificate.

## **10. The decision**

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

- the internal stair balustrade does not comply with Clause F4, and
- the wall framing does not comply with Clauses B1 and B2, and
- the exterior building envelope does not comply with Clauses E2 and B2 of the Building Code that was current at the time the consent was issued;

accordingly I confirm the decision of the authority to decline to issue a code compliance certificate for the original building consent.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 12 September 2014.

John Gardiner  
**Manager Determinations and Assurance**