



## Determination 2017/005

# Regarding the code compliance of remediation work to a 15-year-old house at 238 Plummers Point Road, Tauranga



### Summary

This determination considers the authority's reasons for refusing to issue a code compliance certificate for remedial work to an existing house; and whether the work concerned complied with Clause B1, B2, and E2 of the Building Code. The building consent had been issued with requirements for quality assurance in relation to construction monitoring which was also the subject of the dispute between the parties.

### 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 owners of the house, J and P Hudson ("the applicants") acting through an agent ("the building surveyor")
  - Western Bay of Plenty District Council ("the authority"), carrying out its duties as a territorial authority or building consent authority.
- 1.3 The application for this determination arose from the following:
  - The existing house was completed in 2001 although a code compliance certificate was not sought until 2012. The authority carried out final and issued a code compliance certificate on 19 December 2012.

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

- Surface coating problems were subsequently observed and the applicants engaged the building surveyor, who investigated and reported on evidence of wide spread moisture penetration and damage in February 2013.
- The building surveyor developed a scope of remedial works followed by documentation for cladding removal and framing replacement. In November 2013 the authority issued a building consent for Stage One, which was amended in March 2014 to include the re-cladding work.
- During 2014, the owners instigated civil proceedings against the authority that involved evidence from the building surveyor's investigations. In the meantime, remediation work was substantially completed by the end of 2014.
- In February 2015, the authority applied for a determination to clarify the status code compliance certificate for the original house because the certificate lacked a notation regarding the modification of Clause B2.3.1. In June 2015<sup>2</sup>, I concluded that a notation was not needed because the consent amendment is included in the authority's property file, and the issue of the code compliance certificate was confirmed.
- Civil proceedings were apparently settled, and the building surveyor applied for a code compliance certificate for the remediation work in February 2016. The authority would not inspect the work and refused to issue the code compliance certificate without an additional report from an independent professional.

1.4 The matter to be determined<sup>3</sup> is therefore the authority's exercise of its powers of decision in refusing to issue a code compliance certificate for the reasons given in its letter dated 17 June 2016. In deciding this matter, I must consider whether the remediation work carried out to the building envelope of the house complies with Clause B1 Structure, Clause B2 Durability, and Clause E2 External moisture of the Building Code. The building envelope includes the components of the systems (such as the repaired timber framing, the monolithic wall claddings, the roof claddings, the substrates, the wall and roof glazing, the decks and the flashings), as well as the way components have been installed and work together.

1.5 In making my decision, I have considered the submissions from the parties, the building surveyor's reports, the report of the expert commissioned by the Ministry to advise on this dispute ("the expert") and the other evidence in this matter. In this determination, the various reports are referred to as follows:

**Table 1: The relevant reports**

Date	Report by:	Report for:	Purpose	Title in this determination
19 Feb.13	building surveyor	owners	Building envelope investigation	"the surveyor's first report"
undated	building surveyor	owners	Preliminary remedial scope	"the scope of remediation"
21 Aug.14	building surveyor	authority	Weathering detail clarification	"the surveyor's second report"
10 Aug.15	building surveyor	owners	Remedial works record	"the surveyor's third report"
11 Dec.15	expert	Ministry		"the expert's report"

<sup>2</sup> Determination 2015/027 Regarding the issue of a code compliance certificate for 11-year-old additions and alterations to a house with monolithic cladding, 3 June 2015

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

## **2. The building work**

### **2.1 The 2000 alterations**

- 2.1.1 An original house was constructed on the site in about 1975, which had incorporated concrete foundations and floor slab, concrete block basement walls and a suspended concrete floor slab below the upper level. These elements were retained and added to as part of extensive additions during 2000, which resulted in the detached house with a detached garage completed in 2001.
- 2.1.2 The house is two-storeys high in part and is situated on a sloping coastal site in a very high wind zone<sup>4</sup> for the purposes of NZS 3604<sup>5</sup>. The two-storey section includes the lower level concrete construction set into the slope of the site, with the single-storey upper level extended as an attached garage and a self-contained guest wing, with a detached garage building to the south west as shown in Figure 1.
- 2.1.3 The main house is very complex in plan and form and is assessed as having a very high weathertightness risk. The single storey sections are less complex but incorporate some complex junctions and are assessed as having a moderate to high risk. The expert takes the garage doors as facing south east and this determination follows that convention.
- 2.1.4 The lower level of the house is a combination of new and original construction, with specifically engineered concrete slab foundations, reinforced concrete masonry walls and a precast concrete first floor slab. The upper level is generally conventional light timber frame, with monolithic-clad timber-framed walls and aluminium windows.
- 2.1.5 The 2000 wall cladding to the upper level was a proprietary form of monolithic cladding system known as EIFS<sup>6</sup> system consisting of polystyrene backing sheets fixed directly to the untreated framing over the building wrap, to which a proprietary plaster system was applied. For the lower level, polystyrene backing sheets were fixed to the concrete block walls and plastered to match the upper walls.
- 2.1.6 The 20° to 45° pitch hipped and gabled roofs were clad in clay tiles, with membrane canopy roofs and low-pitched membrane sections linking the tile roofs. Parapet walls surrounded most of the pitched roofs; with concealed membrane-lined gutters behind, and the EIFS wall cladding extended up to form parapet cappings. The canopies and a tiled upper deck were supported on EIFS-clad columns.

### **2.2 The 2014 remediated house**

- 2.2.1 During Stage One of the remediation work, original wall and roof claddings were removed from the framing and damaged timber was replaced with treated timber, with the retained untreated timber framing site-treated with a timber preservative.
- 2.2.2 Stage Two of the remediation work included new roof and wall claddings, together with associated reinstallation of roof and wall glazing as shown in Figure 1.
- 2.2.3 New concrete upstands were added beneath timber-framed walls adjacent to the north deck and the west patio, with a screed topping over existing concrete to provide falls to drainage outlets. New deck tiles are installed on pedestals to allow drainage via joints to underlying membranes. New stainless steel and glass balustrades are side-fixed to the deck perimeter plastered concrete fascia.

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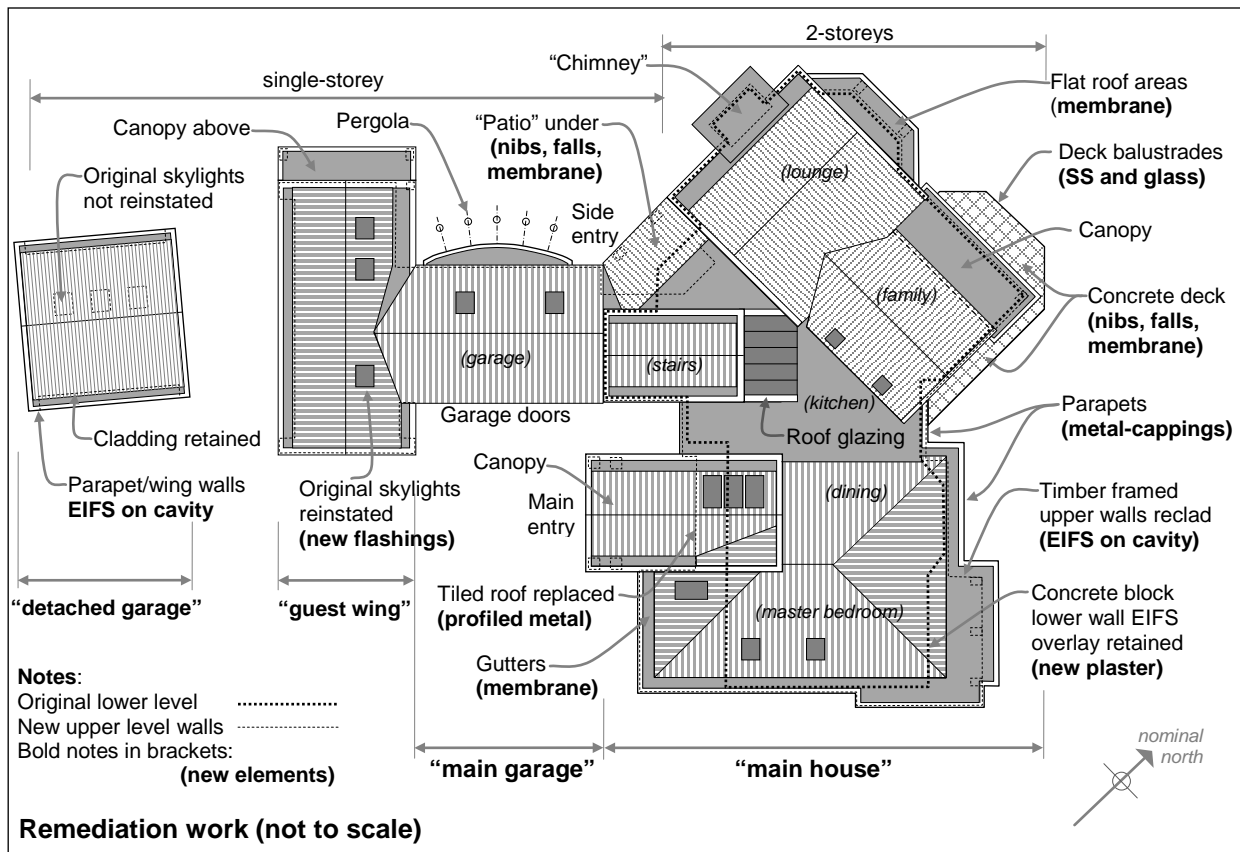
<sup>4</sup> According to the authority's LIM report (amended in the expert's second report)

<sup>5</sup> New Zealand Standard NZS 3604:1999 Timber Framed Buildings

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

## 2.3 The wall cladding

2.3.1 The new wall cladding is a proprietary EIFS system that includes flashings to heads, jambs, sills, trims and corners. The system incorporates 40mm thick expanded polystyrene backing sheets finished with a multi-coat fibreglass mesh reinforced synthetic resin plaster system. The plaster is extended down to recoat the existing overlaid EIFS cladding on lower level exterior concrete block walls.



**Figure 1: Stage Two of the remediation work**

2.3.2 The backing sheets are fixed over proprietary perforated polystyrene battens that provide a drained cavity behind the cladding. Battens are fixed over building wrap and a rigid plywood air barrier (“RAB”) to the framing. The 9 mm treated plywood RAB also provides additional structural bracing to the house. The cladding system includes purpose-made flashings to windows, edges and other junctions.

## 3. Background

### 3.1 The original construction

3.1.1 The authority issued a building consent (No. 63051) to the applicants on 7 April 2000 under the Building Act 1991 (“the former Act”). Inspections were carried out by a building certifier and the house was substantially completed by March 2001, although a code compliance certificate was not sought until 2012.

3.1.2 Final inspections were completed and the applicants applied for an amendment to the building consent in respect of Clause B2.3.1 for the durability periods to commence from the date of substantial completion rather than from when code compliance

certificate was issued. The authority issued a code compliance certificate against the amended consent on 19 December 2012.

- 3.1.3 At some stage, the applicants became aware of blistering to some areas of the paint coatings and engaged the building surveyor to investigate the problem – initially considered to be surface damage only.

### **3.2 The surveyor's first report**

- 3.2.1 The building surveyor carried out visual and invasive investigations and provided a report to the applicants dated 19 February 2013. Visual investigations indicated that the house had 'been kept in very good general condition' and had apparently been repainted three times.

- 3.2.2 The surveyor noted high-risk design features and areas 'clearly exhibiting current failure through cracking', with non-invasive moisture testing revealing anomalies over large areas of cladding. The surveyor invasively tested the latter areas and removed small sections of cladding or lining to investigate the underlying framing.

- 3.2.3 The surveyor's investigations revealed the following (in summary):

- cracking and high moisture levels in most roof parapets, with severe decay in timber framing below
- high moisture levels in upper walls below roof parapets, with advanced decay in timber framing – extending to the bottom of some walls
- high moisture levels and timber damage at the base of some single-storey walls, where soil levels had been elevated until recently
- acceptable moisture levels at windows isolated from parapet walls
- acceptable moisture levels at upper deck walls sheltered by overhangs, but high levels at the more exposed north east corner
- high moisture levels and decay in the west lounge wall.

- 3.2.4 The surveyor noted that his investigations confirmed 'widespread building envelope failures' and further damage could be revealed during remediation. Major repairs to structural framing were required 'along with extensive roof membrane work and the re-design of critical junction flashings', with replacement wall claddings installed on cavities and new parapet cappings installed. The surveyor added that a scope of works and a consent application would be required for the remediation work.

### **3.3 The scope of repairs**

- 3.3.1 The building surveyor prepared a 'preliminary remedial scope table' for budget purposes and to allow drawings to be prepared, noting that adjustments to the scope would be made depending on the extent of damage revealed during the repairs.

- 3.3.2 The table set out the general requirements for the repair work and the repairs required to various elements of the building, which initially included the following:

- remove roof tiles, roof flashings, roof/gutter membrane and parapet cladding
- remove all wall cladding from timber framing
- identify extent of timber decay and replace all damaged framing, with retained timber treated in-situ

- identify extent of roof substrate damage and replace all damaged plywood<sup>7</sup> and parapet framing
- install new CCA H3.2 rigid air barrier and building wraps to walls
- install new EIFS cladding system over cavities
- install new roof membrane, saddle flashings and metal parapet cappings
- leave windows in place depending on timber damage revealed<sup>8</sup>
- remove deck balustrade<sup>9</sup> and deck tiles, install new drainage to outlets
- install 150mm concrete nibs to raise thresholds and screed to falls
- install new deck membrane and tiles over mounting blocks.

### 3.4 Scheduling of the remediation work

3.4.1 Consent drawings and specifications were prepared for the remediation works, with the demolition and framing/substrate replacement intended to be carried out as Stage One, in order to allow detailed drawings for claddings to be submitted and processed without delaying progress of the work.

3.4.2 The work was scheduled to allow for the:

- owners to temporarily occupy the existing self-contained guest wing
- substantial completion of Stages One and Two for the main house and garage
- owners to vacate guest wing and reoccupy the main house
- completion of Stage One and Two for the guest wing and detached garage.

3.4.3 An application for a building consent was lodged and the authority's internal 'Advice notes' of 19 November 2013 on the proposed works included the following note:

This building consent (stage 1) will be limited to the removal of existing cladding (of the entire house) with provision for scaffolding and protection wrapping to allow for detail investigation of the nature of water damage, including timber replacement where necessary. Full detail of the recladding works and associated remedial works to the building envelope will be submitted for approval as part of separate stage (either as separate building consent application or as amendment application).

3.4.4 The authority issued a building consent (No.85150) on 28 November 2013 for:

Remove cladding and partial replacement of timber framing – Stage 1 of 2

3.4.5 The contract agreement with the builders was based on NZS 3910:2003<sup>10</sup>, with the building surveyor engaged to act as 'remediation specialist and engineer to the remedial contact' under Section 6. The surveyor explained that his:

...input effective role was also as Clerk of Works to the project, carrying out regular inspections and recording both progress and compliance with the plans, making necessary adjustments, collating and directing design revisions with the Architects and assessing when larger more critical adjustments to design required revision drawings.

<sup>7</sup> An additional layer of plywood was subsequently added to strengthen the substrate

<sup>8</sup> Most windows were left in place as there was no evidence of failure except at arch-topped windows

<sup>9</sup> The original deck balustrade was subsequently replaced

<sup>10</sup> NZS 3910:2003 Conditions of contract for building and civil engineering construction

### **3.5 Remediation of the main house and attached garage**

3.5.1 Work started on Stage One of the main house and the authority recorded an inspection on 22 January 2014 ‘to sight new and existing framing’; noting new treated framing and on-site treatment of retained timber and ply overlay. Further inspections of substrate fixings, other exterior ply, saddle flashings and window head flashings followed on 3, 11 and 25 February 2014.

3.5.2 In a letter to the applicants dated 4 March 2014, the authority confirmed that the remaining remediation work had been approved and the building consent was amended as following:

STAGE 2 of 2 – Recladding walls, re-roof and associated remedial works to the building envelope in connection with Stage 1 works.

3.5.3 The authority’s inspections continued as follows (in summary):

- building wrap on 31 March 2014
- backing sheets to parapet walls, framing to rear of garage on 16 April 2014
- cavity battens and flashings on 8 May 2014
- partial pre-plaster, with all backing sheets on cavity in place on 6 June 2014.

3.5.4 The next inspection on 26 June noted a ‘list of failed items not resolved’, which included the need for up-to-date quality assessment documentation and changes in some parapet, skylight, flashing and some other details. The following inspection on 7 July reviewed ‘failed items’ and included the following notes:

Work must stop to review and resolve all failed items  
Work is to stop until contractors produce up to date Q.A. document.  
Amended drawings required showing as built flashing details.  
If work continues and details not sighted or confirmed... ..it may be necessary to [continue] inspections to confirm compliance with approved plans and details.  
  
ALL WORK MUST STOP; amendment and updated plans provided for approval before restarting any further work.

3.5.5 Subsequent inspections on 11, 22 and 24 July 2014 were apparently ‘unrequested and unnotified’ and records repeated that ‘all work must stop’, with handwritten site notices left on site. The inspection record of 31 July 2014 also indicated that work to the main house was substantially completed, by noting ‘weathertight inspection required to roof/external cladding before final inspection.’

### **3.6 The site meeting and surveyor’s second report**

3.6.1 According to the building surveyor, the increased frequency and style of inspections indicated a ‘change in the authority’s attitude and approach’ concerning the need to adjust detailing without lodging ‘full revision drawings’ for prior approval.

3.6.2 In response to deteriorating site relationships the building surveyor requested a meeting to discuss the situation, which was held on on-site on 11 August 2014. When questioned on the change in inspection processes, the authority apparently stated that it had decided to ‘take a more active and harder line to all inspections on this property – because there was a damages claim pending.’

3.6.3 Following the site meeting, the building surveyor wrote to the authority on 21 August 2014, attaching revised drawings and a ‘weathering detail clarification report’. The letter noted the hope that these would see ‘this project back on track and the remedial team again on more equitable terms’ with the authority inspectors.

3.6.4 The report contained construction photographs with detail explanations of the need for changes and adaptation of flashings to the original situations uncovered as the work progressed. In particular, the report focussed on the following areas:

- upstands, falls and drainage outlets to internal parapet gutters
- parapet capping flashings, saddle flashings and other custom made flashings to various junctions
- installation of custom made flashings and diverters to sloped staircase glazing
- installation of flashings to re-installed skylights into new metal roofing
- wall junctions of new concrete deck nibs
- original and replacement framing to exterior corner at master ensuite shower.

### **3.7 Remediation of the guest wing and detached garage**

3.7.1 Remediation of the main house was substantially completed by the end of July 2014 and the owners moved back into the house to allow repairs of the guest wing to be undertaken. Work continued throughout August into September, with three further inspections carried out. The record of 21 August noted 'continue at own risk, detail changes still required', with notes on 28 August stating:

Any details not shown on approved building consent plans are to be submitted to council as amendments.

3.7.2 The last inspection record was dated 24 September 2014, and noted that guest wing windows had been removed and photos of window re-installation were needed along with amended joinery details. I have seen no records of further inspections.

3.7.3 The building surveyor issued a 'Certificate of Practical Completion' dated 22 November 2014 to the contractors, which attached items to be attended to and noted:

The above works have been completed as defined under Section of NZS 3910:2003, the General Conditions of Contract.

This is effective from 22<sup>nd</sup> December 2014...

### **3.8 The surveyor's third report**

3.8.1 The building surveyor's involvement with the applicants' litigation apparently 'escalated and required a large time focus'; delaying completion of the required documentation, which included a review of the project.

3.8.2 The surveyor provided the applicants with a 'Remedial Works Review' dated 1 September 2015, which set out the background and summarised the initial investigations carried out and the repairs undertaken, including the following comments (in summary):

- The initial investigations revealed extensive weathering failures that had resulted in widespread water ingress and timber decay, which was particularly extensive at walls directly below roof parapets.
- When roof tiles were removed around the parapets and skylights, further framing damage was discovered at junctions with the latter and also at tile battens as a result of wind-blown rain entering the tile overlaps.
- Identification of deficient materials and detailing resulted in the decision to remove the clay tile roofing to repair and amend the framing and to replace the roof with profiled metal.



- The membrane roofing and internal gutter membrane was removed to allow reframing and strengthening of support to meet current standards, including increasing gutter capacities and drainage and installing overflow provisions.
- Insulation was installed while recladding the timber framed upper level walls, with plywood added as a rigid air barrier and additional bracing.
- A variety of custom-fabricated fully welded cappings, back flashings and saddle flashings were installed to all critical roof parapet and cladding junctions to augment the wall cavities by directing moisture to the outside.
- The guest wing and detached garage building walls suffered similar but less extensive damage, which was limited to parapets and wing walls beneath. Garage parapet walls were reclad to match the main house, with the balance replastered over repaired existing direct-fixed EIFS.

3.8.3 The report includes a 'photographic summary and annotation', which 'tracks the basics of the remediation process in clarification of systems and processes used in the restoration of both the main house and ancillary buildings.' The record shows the progress of the work, the damage uncovered and explanations of new underlying flashings and other elements. In summary, the record includes:

- temporary weather protection, damage revealed and framing repairs carried out
- upstands, falls, drainage outlets and membrane installation to parapet gutters
- saddle flashings and other custom made flashings to various roof junctions
- installation of profiled metal roofing, skylights and associated flashings
- installation of membrane flashings, saddle flashings and cappings to parapets
- replacement of damaged wall framing and in-situ treatment of retained timber
- installation of plywood rigid air barrier/bracing, wrap and cavity battens
- installation of new proprietary uPVC flashings to existing windows
- installation of new backing sheets with proprietary uPVC flashings
- application of fibre glass mesh and plaster coating
- deck nibs, threshold bars, screed and membrane installed and outlets replaced
- installation of new raised tiles and balustrades to deck.

3.8.4 The report attached copies of the completed Quality Assurance record, relevant producer statements and other documentation. The 'Remedial Works Review Statement' at the beginning of the report summarised the work and concluded:

On the basis of my inspection regime completed at all critical stages of the remedial works completed by [the builder] and in conjunction with all relevant producer statements supplied as requested by [the authority], I believe on reasonable grounds that the building works have been completed as per the submitted construction documentation and in accordance with best practice of the day and the relevant requirements of the building consent with respect to the specific clause(s) B2 – (Durability) and E2 – (External Moisture).

### **3.9 The application for a code compliance certificate**

- 3.9.1 The building surveyor submitted the required documentation and applied for a code compliance certificate on the owners' behalf, which was received by the authority on 16 February 2016. Despite requests, the authority did not carry out a final inspection and apparently did not acknowledge the application.
- 3.9.2 In an email to the authority dated 17 May 2016, the applicant noted it had been three months since the application and no clarifications or updates on its status had been provided in response to queries. The applicant expressed his concern that the delays related to 'the legal action we took last year' and asked the authority to 'expedite the processing' as the lack of a code compliance certificate was impeding the sale of the property.
- 3.9.3 The authority responded on 19 May 2016, noting that the authority was 'approaching the application for code compliance certificate with the utmost caution given the impact of recent litigation.' The authority also explained that the inspector responsible for the project was no longer available and:
- ...given the complexity of the remediation work a final inspection and recommendation to issue [code compliance certificate] is quite simply beyond the scope and expertise of other Council inspectors.
- 3.9.4 Without the continuity of the former inspector, the authority considered it 'would find it difficult to satisfy itself on reasonable grounds that the requirements of the Code have been met.' The authority was also 'mindful' that the building surveyor had lodged the application for code compliance certificate 'after having been intimately involved in the litigation process' and therefore considered that:
- ...the most pragmatic way forward is for you to retain the services of a [different] registered building surveyor... ...who can provide a report to give the necessary independence Council desires and the level of rigour that this decision deserves.
- 3.9.5 The authority's position was confirmed by its legal advisors in a letter to the building surveyor dated 17 June 2016, which denied that the previous litigation was a consideration in the authority's decision on whether to issue the code compliance certificate. The last inspection had been carried out on 24 September 2014 and the authority stated that:
- Given the lack of ongoing inspections throughout the process, the passage of time since the works were completed, and the nature, scale and complexity of the remedial works, it would be unreasonable to expect [the authority] to be able to be satisfied on reasonable grounds that the property is compliant without [an independent] report from, say, a member of the New Zealand Institute of Building Surveyors, or other professional ...
- 3.10 The situation remained unresolved and the building surveyor applied for a determination on the applicants' behalf, which was received by the Ministry on 16 August 2016.

## **4. The submissions**

- 4.1 The building surveyor made a submission on the applicants' behalf, explaining the background and circumstances that resulted in the current situation. The building surveyor also explained his involvement in the project from the initial investigations through to completion of the remediation. (I have included this background in the preparation of this determination as I consider appropriate.) The surveyor considered that an additional report was not necessary in the circumstances.

- 4.2 The applicant provided copies of:
- the building consent and code compliance certificate for the original house
  - the reports outlined in Table 1
  - consent documentation for the remediation work
  - the authority's inspection records
  - correspondence with the authority
  - various other statements and information.
- 4.3 The authority made no submission and provided no further information for this determination.
- 4.4 The draft determination was issued to the parties on 16 December 2016.
- 4.5 The applicant accepted the determination on 21 December 2016 and the building surveyor made the following comments:
- While air seals were not a requirement at the time of the original work, all windows in the remediated buildings have air seals installed.
  - The ground clearances to the cladding to the garage are noted in the draft determination as an area that needed to be addressed for maintenance of the house to ensure ongoing compliance with the Building Code. Only external corners were reclad as part of the remediation work, as there was no evidence of damage to warrant recladding the entire garage.
  - It was accepted that the Q/A record was not kept fully up to date 'due to the difficulty of the piecemeal work patterns, inevitable with complex weathertightness remediation' rather than negligence. The Q/A record, while a condition on the consent, was supplanted by the building surveyor's inspection program which more accurately recorded the completed work. The recording methodology was clearly recorded in the building consent documentation.
- 4.6 The authority accepted the draft determination without comment on 27 January 2017.

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

### **5.1 General**

- 5.1.1 As mentioned in paragraph 1.5, I engaged an independent expert to assist me who is a member of the New Zealand Institute of Building Surveyors. The expert inspected the house with the owners and the building surveyor on 19 September 2016 and reviewed the documentation and reports provided by the surveyor, providing a report on 18 November 2016. The parties were provided with a copy of the report on 21 November 2016.
- 5.1.2 The expert was engaged to investigate and to provide a view on:
- the standard of the completed work
  - the nature and extent of as-built changes from the consent drawings
  - the documentation provided by the building surveyor
  - taking into account the surveyor's experience, whether the evidence provides reasonable grounds that the work complies with the Building Code.

- 5.1.3 The expert noted that the building work appeared to be ‘completed to a high quality, top-end standard, with exterior claddings generally ‘straight and fair of finish’ and roof and other flashings ‘neatly installed’ and operating effectively. The building was well maintained, with only minor issues outstanding.

## 5.2 Changes from consent drawings

- 5.2.1 The expert compared stamped consent drawings with the set of amended drawings. Sheets 00 (overview notes), 01(site plan) and 02 (elevations) showed a print date of 2 September 2014, and the remaining 20 drawings a print date of 20 February 2015. Amended drawings included changes from stamped consent drawings as follows:

- arched top window to lounge shown in elevations but not originally installed
- north deck perimeter concrete fascia/nib plastered not tiled
- west patio concrete nib details added
- various other obsolete references removed.

- 5.2.2 The expert noted that the ‘overall architectural shape and form’ of the work was largely in accordance with the stamped consent drawings and/or the amended drawings, although some differences were observed including:

- custom saddle and kickout added to stairwell sloping glazing but not detailed
- most overflows to parapet gutters amended from gutter base to parapet walls and detailing of overflow scuppers changed
- new ply substrate added over original under membrane roof areas and gutters
- original skylights shown in detached garage roof not reinstated
- head flashing detail to meter board changed
- saddle flashings flanges shown plastered over, but finish proud of cladding
- some obsolete notes and details still refer to tile roofing.

## 5.3 Items raised during inspections

- 5.3.1 The expert examined the site inspection records, noting that these covered an eight-month period. The expert commented on some items highlighted in the records and the more significant items and comments are included in Table 2.

**Table 2: Site inspections in 2014**

Date	Inspection items	Expert's comments
Main house and attached garage		
22 Jan	Need flashing details	Flashings appear satisfactory but several as-built details missing (e.g. <b>stairwell glazing</b> )
	Need details for existing window openings	Cladding manufacturer approved detailing – location plan for existing left in situ and existing re-installed would be useful.
	Ongoing details with one amendment at end	Appeared to work on this basis until June
3 Feb	Need detail for gas flue gutter penetration	Appears satisfactory – shown on sheet 10
	Still need window details	Details in sheet 09 - appears satisfactory
	Sighted mock-ups of saddle flashings	Appears satisfactory
	All junction flashings to be sighted	Appears satisfactory

Date	Inspection items	Expert's comments
11 Feb	Amended window, roof details to come Confirm condition of membrane substrate	Various details included on updated drawings Overlaid with additional ply to comply with manufacturer's instructions Producer statement from approved installer
25 Feb	Sighted head flashings To sight/confirm full window flashing setup	Not raised again
3 March	Discussed membrane upstand/lap under purlins at parapet gutters	Not raised again – no apparent issue on site
31 March	Seal small gaps to curved head flashings	Now sealed
16 April	Discussed membrane behind ends of head flashings <sup>11</sup>	
8 May	Need flashing detail to stairwell roof glazing QA checklist to be kept up-to-date and to include surveyor's inspection records <sup>12</sup>	Appears satisfactory, but not yet detailed
6 June	Roofing/gutter overhang detail	Detail on sheet 12 does not show foam closure Roof pitch does not require back flashings
26 June	Roof underlay overhang to fascia board Rear roof overflow penetration Roof pans to turn down Side flashings to skylights Parapet details to accord with approved dwgs Keep up- to- date QA documentation onsite Submit amended flashing details for existing skylight <sup>13</sup> for approval Submit saddle flashing details for concrete deck nib to wall junctions	About 40mm overhang – minor and unlikely to result in failure Not raised again – no apparent issue on site Roof pitch does not require back flashings Adequate cover provided As built reflects amended drawings
7 July	Stop work until 'failed' items reviewed/resolved QA documents still not on site Remove irrelevant details from drawings All items shown on drawings to be inspected Need method of preserving shower membrane when exterior framing replaced	<b>Not yet shown on amended drawings</b> Refer below – no apparent issue on site
11 July	Architect's site inspection notes required Submit membrane saddle flashing details for concrete deck nib to wall junctions, deck falls Require pool audit	Not seen Upper deck – no apparent issue on site (photographic records in report) (pool not part of remediation consent)
22 July	QA documents still not on site	
24 July	Amended drawings and QA docs required If not, job will be stopped and NTF issued Without details, destructive investigation may be required Not approved to continue	

<sup>11</sup> Presumably related to parapet/stairwell glazing junctions

<sup>12</sup> Last entries on 23 December 2014 – copy included in the surveyor's third report (the remedial works record dated 10 August 2015)

<sup>13</sup> Presumably related to parapet/stairwell glazing junctions

Date	Inspection items	Expert's comments
Guest Wing and Garage building		
31 July	Sighted Framesaver being spray applied	All preservative apparently brush-applied
21 Aug	As built parapet gutter detail differs from dwgs	Generally conform to main house and amended drawings
	Overlay over original substrate – due to membrane warranty issues with plywood	Was comment only – overlaid with additional ply to comply with manufacturer's instructions
	Original wrap not taken fully into window openings – need confirmation that will be remedied when joinery taken out	Only applies to NW unit beneath canopy Other joinery left in situ (original construction was pre-E2/AS1 - wrap/tape not commonly installed in 2000 )
10 Sept	Joinery removed for wrap/tape installation <sup>14</sup> No air seals installed to original windows	(original construction pre-E2/AS1 - air seals rarely installed in 2000 )
	Not all garage walls reclad	Some original cladding retained and patched Extent not shown on amended drawings
	Garage parapets wrapped and tops taped	
24 Sept	Meter box flashing details required	Appears satisfactory but as built detail needed
	Confirm air seals to replaced windows in guest wing – provide photographs	Only applies to NW unit beneath canopy. Other joinery left in situ
	Garage cladding clearances non-compliant	Cladding not in contact with ground Garden levels should be lowered Paving levels adequate in circumstances
	Require as-built cladding/details for garage Require as-built details for guest wing	As built drawings should reflect changes noted above.
	Next inspection to be pre-plaster	(QA record notes 'pre-plaster inspect not required' with name of authority official noted.

5.3.2 The expert made the following additional comments relating to the inspection records (with my comments added where I consider appropriate):

- The authority made repeated requests over a period of 11 weeks for updated QA documentation to be kept on-site, but the QA checklist submitted with the code compliance certificate application shows items initialled by the contractor during that period.
- Although the lack of on-site documentation 'reflects somewhat poorly on the management systems' during construction, there is no evidence of significant shortcomings in the quality of the completed work.
- The recording of the authority's site inspection rechecks could have been better documented; in that the inspector referred to 'failed' items then made no reference to when/if these were subsequently rechecked and passed.
- Although some detailing changes are not included in the amended drawings, the assessment identified no evidence that this has affected compliance (I note that most changes are likely to have improved performance.)
- I also note that some items identified during inspections relate to original windows that had not suffered any moisture problems since construction in 2001 and had been left in-situ during remedial work. Air seals and full E2/AS1 detailing to those windows would not be likely for 15-year-old installations – and these already had a proven in-service history of adequate performance.
- Cladding clearances above paving to the detached garage have also performed since construction and are considered adequate in the circumstances. However,

<sup>14</sup> I note that only the large bifold doors/window unit under canopy removed – others not in line with roof parapets and left in place during work (as per the main house recladding work)

clearances above unfinished ground are significantly less than that described in E2/AS1 and ground levels should be lowered to reduce future risks.

## **5.4 The building surveyor's background and experience**

5.4.1 The expert noted the surveyor's relevant experience in this type of remedial work included having (in summary):

- been a qualified registered building surveyor and NZIBS member since 2000
- been an approved WHRS assessor since 2002
- inspected/reported on more than 500 buildings with weathertightness issues
- acted as 'the engineer' in more than 200 leaky building NZS 3910 contracts
- more than 40 years working knowledge of building and construction issues.

## **5.5 The expert's conclusions**

5.5.1 Although there was some QA doubt related to underlying work now concealed, the expert observed no evidence of any shortcuts or careless construction and therefore 'on balance, the high standard of the visible completed work is considered a fair reflection of the work now unable to be inspected.' (I note that there is also an extensive series of construction photographs that supports this view.)

5.5.2 The expert summarised his conclusions as follows:

- The [building surveyor] was considered to be highly experienced in this type of remedial work and has a reputation for delivering quality top-end remedial repairs to leaky buildings in the Bay of Plenty.
- The available documentation generally provides an adequate record of the remedial work.
- There was a reasonable correlation of the amended work with the amended consent plans, with the inspections recording various discrepancies.
- The high standard of the completed work is likely to be a reasonable indication of the quality of the work that is now unable to be inspected.
- Inadequate cladding clearance to the gardens adjacent to the detached garage is likely to affect code compliance.

5.5.3 The expert considered that the building surveyor's reports together with the drawings and the inspection record provide 'extensive and generally adequate documentation of the remedial work undertaken' and concluded:

In my opinion, the evidence is reliable to form reasonable grounds that the work has been completed in accordance with the consent and is generally compliant with the building code.

## **6. Discussion**

### **6.1 Compliance of the building envelope**

6.1.1 The building consent was issued under the Act, and Section 94(1)(a) of the Act requires an authority to 'issue a code compliance certificate if it is satisfied, on reasonable grounds' that the building work complies with the building consent. Minor changes to this building work during construction were noted by the authority and the expert, which have not been recorded in the amended drawings.

6.1.2 When considering the issue of a code compliance certificate for a building consent where the as-built construction differs from that consented, it is important to consider whether the completed work complies with the Building Code.

## **6.2 Performance of the remediated claddings**

6.2.1 The weathertightness and durability of the remediated building envelope is dependent on design features in this house that increase weathertightness risks, features that protect the claddings and underlying framing, features included in the cladding systems, the workmanship of the installed claddings and the consequences of any potential failure on underlying construction.

6.2.2 In regard to the subject, I have taken the following circumstances into account (in summary, taking into account the expert's and building surveyor's reports):

- The lower level of the main house and the suspended floor above are concrete, with remediation limited to replastering exterior concrete masonry walls.
- The upper level of the main house, including the single-storey detached garage and guest wing are timber framed, with complex roof parapets and junctions. The new EIFS cladding to these areas is now installed over a drained cavity.
- All damaged timber framing was exposed and replaced with treated timber, with retained timber site-treated. All roof claddings have been replaced, with junctions, intersections and falls redesigned to decrease risks of moisture entry.
- Other areas, such as the deck and patio, have been altered and features added to reduce the risks of future moisture penetration into timber framing.
- The detached garage walls have been partially reclad, with original direct-fixed EIFS retained to some areas with lower weathertightness risks and no in-service history of moisture problems over the past 15 years.
- The remediation was undertaken under the project management of a building surveyor experienced in assessing and remediating leaky buildings. The authority carried out numerous inspections during repairs to the main house.
- The building surveyor maintained an extensive photographic record of exposed defects and damage, work undertaken to repair that damage and the details constructed to reduce potential moisture problems.
- The remediation work has been carried out to a high standard and the building envelope is well maintained. The expert observed no significant defects.

6.2.3 Taking account of the above and the other evidence, I have reasonable grounds to conclude that the exterior walls and roofs of this particular house are likely to be adequate in these particular circumstances.

6.2.4 I note the expert's comments concerning cladding clearances around the detached garage building and I accept that driveway paving clearances are adequate in these particular circumstances.

6.2.5 However, cladding clearances above unfinished ground are less than that described in E2/AS1.

6.2.6 I also concur with the expert's opinion that cladding clearances above unfinished ground are significantly less than that described in E2/AS1 and should therefore be lowered to avoid the risk of soil and/or vegetation allowing moisture to enter the cladding system and reaching underlying timber. However, taking its in-service history to date and its function as a garage into account, I consider that this work may be attended to as part of on-going maintenance of the house (see paragraph 6.4.2).



### **6.3 Departures from the building consent drawings**

- 6.3.1 Variations from the consent documents are to be expected for remediation work as underlying construction is exposed. A proper process for dealing with these should have been established that took into account the practical considerations and time constraints of such work. Amended drawings incorporating most of the variations were completed after the work was finished.
- 6.3.2 When the changes are minor and the work complies with the Building Code an authority may choose to record these by way of adequately detailed as-built drawings. The procedure for addressing such changes is addressed in the Building (Minor Variations) Regulations 2009, which defines minor variations. In this case, I consider that the variations are not of such a significant level that they would warrant a formal amendment of the building consent.
- 6.3.3 I also take the view that when considering the compliance of the work with the building consent there will be instances where the consent documentation lacks all the details required to establish compliance with the Building Code. My approach in these instances is to consider whether the as-built aspects comply with the Building Code. I am of the view that I am also able to consider evidence that may come to light during the determination process (such as the various reports provided in this case), if that evidence helps to establish the compliance of the building work.
- 6.3.4 Having established some departures from the consent and amended documents, the expert needed to assess the effect of any departure. This entailed considering whether the claddings and the timber frame comply with Clauses B1 and E2, notwithstanding those departures.
- 6.3.5 During his inspection, the expert observed no significant defects in the remediated building envelope and concluded that departures were therefore unlikely to result in a failure to comply with the performance requirements of Clause E2. Photographs and other records pertaining to underlying construction satisfy me that any departures are also unlikely to result in a failure of the timber framing to comply with performance requirements of Clause B1.
- 6.3.6 Taking account of the expert's report and the other evidence, I am able to conclude that, although the building envelope remediation did not comply with the original building consent documentation in some respects, the associated parts of the building comply with the relevant parts of Clauses B1, B2 and E2 of the Building Code.

### **6.4 Maintenance**

- 6.4.1 Effective maintenance of the house is important to ensure ongoing compliance with the Building Code and is the responsibility of the building owner. The Department has previously described maintenance requirements associated with the external building envelope, including examples (for example, Determination 2007/60).
- 6.4.2 In the case of this particular house, I note the following:
- The house has been well-maintained and has a number of high risk features. Continuing maintenance is required to ensure the ongoing compliance of the building envelope.
  - Although the cladding must remain weathertight for the required minimum 15-year period, the expected life of the building as a whole is considerably longer, and careful maintenance is required to protect the underlying framing to ensure it meets its required minimum life of 50 years.

## **6.5 Conclusions**

- 6.5.1 I consider the expert's report, the established in-service record of any original joinery units left insitu, and the absence of any evidence to the contrary establishes that the current performance of the remediated building envelope is adequate. Consequently, I am satisfied that the claddings comply with Clause E2 of the Building Code and the repaired timber framing complies with Clause B1 of the Building Code.
- 6.5.2 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, and that includes the requirement to remain weathertight. 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. I consider that the expert's report and the other evidence have satisfied me that the remediated building envelope complies with Clauses B1, B2 and E2.

## **7. The decision**

- 7.1 In accordance with section 188 of the Building Act 2004 I hereby determine that the remediated claddings comply with Clause B1 Structure, Clause B2 Durability, and Clause E2 External moisture of the Building Code, and accordingly I reverse the authority's decision to refuse to issue a code compliance certificate.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 1 February 2017.

John Gardiner  
**Manager Determinations and Assurance**