Department of Building and Housing
Te Tari Kaupapa Whare

Determination 2011/063

Regarding a notice to fix issued for 8-year-old additions and alterations to a house at 15 Lingarth Street, Remuera, Auckland

1. The matters to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004[1] ("the Act") made under due authorisation by me, John Gardiner, Manager Determinations, Department of Building and Housing ("the Department"), for and on behalf of the Chief Executive of that Department. The applicants are the owners, N and N Wilson ("the applicants") and the other party is the Auckland Council ("the authority"), carrying out its duties as a territorial authority or building consent authority.

1.1.1 This determination arises from the decision of the authority to issue a notice to fix for 8-year-old additions and alterations to a house because it was not satisfied that the building work complied with certain clauses[2] of the Building Code (First Schedule, Building Regulations 1992). The authority's concerns regarding compliance of the building work relate primarily to the weathertightness of the exterior building envelope. The authority has also identified defects related to the installation of the solid fuel burner and I have therefore added Clause C to the code requirements outlined in Matter 2 below.

[1] The Building Act, Building Code, compliance documents, past determinations and guidance documents issued by the Department are all available at www.dbh.govt.nz or by contacting the Department on 0800 242 243.
[2] In this determination, unless otherwise stated, references to sections are to sections of the Act and references to clauses are to clauses of the Building Code.

1.2 The matter to be determined[3] is therefore whether the authority was correct in its decision to issue a notice to fix for the alterations. In deciding this, I must consider:

1.2.1 Matter 1: the external building envelope

Whether the external claddings to the additions and alterations ("the claddings") comply with Clause B2 Durability and Clause E2 External Moisture of the Building Code. The claddings include the components of the systems (such as the wall claddings, the windows, the roof claddings and the flashings, as well as the way the components have been installed and work together. I consider this in paragraph 6.

1.2.2 Matter 2: The remaining code requirements

Whether the alterations comply with other relevant Building Code clauses identified in the notice to fix: B1 Structure, C Fire Safety, E1 Surface Water, E3 Internal Moisture, F2 Hazardous Building Materials, F4 Safety from Falling, G9 Electricity and G13 Foul Water. I consider this in paragraph 7.

1.3 Matters outside this determination

1.3.1 The notice to fix also outlined requirements for durability of building elements and stated that the applicants may apply to the authority for a modification of the requirements to allow durability periods to commence from the date of substantial completion of the alterations. I therefore leave this matter to the parties to resolve once the claddings have been made code-compliant.

1.4 In making my decision, I have considered the submissions of the parties, the report of the expert commissioned by the Department to advise on this dispute ("the expert") and the other evidence in this matter.

2. The building work

2.1 The building work considered in this determination consists of extensive additions and alterations to an existing house on a west-sloping site in a medium wind zone for the purposes of NZS 3604[4]. The resulting house is more than twice the size that it was and is assessed as having a moderate weathertightness risk (see paragraph 6.2).

2.2 The original house

2.2.1 The original 1940's house was a single-storey two bedroom state house ("the original house"), with a simple rectangular plan, timber-framed walls and subfloor, stucco wall claddings, timber windows and an 8° monopitched roof.

2.2.2 The original house was extended to the west in 1961 to provide a master bedroom and deck to the east, supported on a retaining wall and metal posts that provided a carport area to the southwest. The internal corner to the northwest was filled in with a deck opening off the living room. A further extension to the east in 1967 provided new bathroom and laundry facilities. At some stage, probably during the 1970's, the original roof was replaced with trapezoidal profiled metal roofing.

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

2.3 The 2001 alterations and additions

2.3.1 The subject alterations included significant additions to the west and east of the house as shown in the site plan sketch in Figure 1:

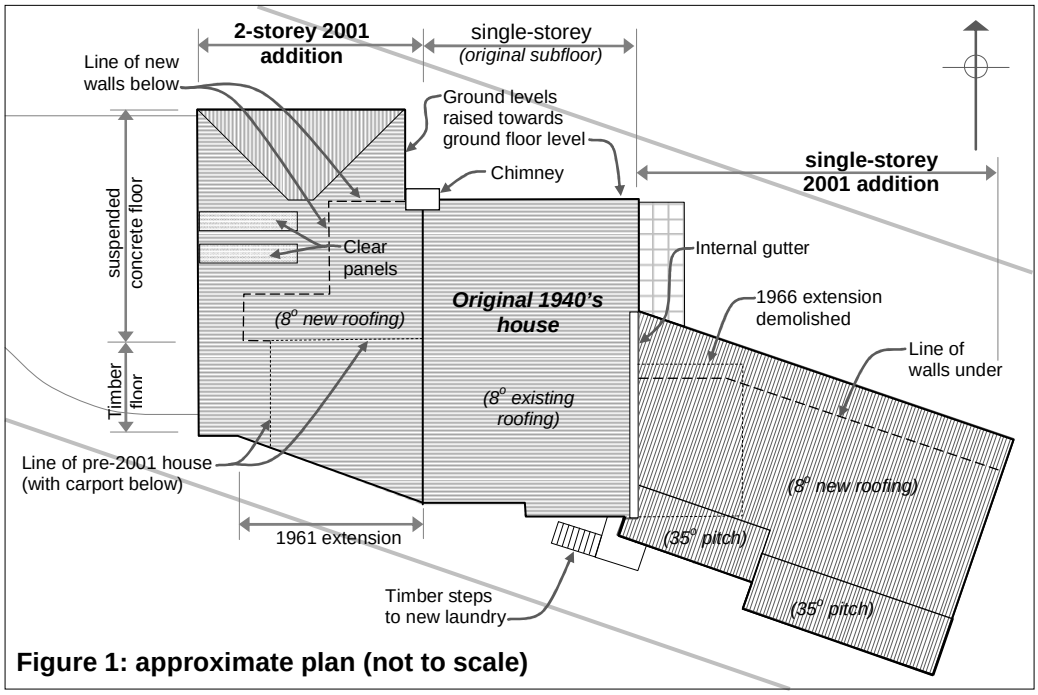

Figure 1: approximate plan (not to scale)

2.3.2 The west addition included:

- demolition of the 1961 decks and carport retaining wall
- the construction of a new basement level to provide:
  - a double garage to the northwest
  - a new basement entry foyer and stairs to the upper level
- alterations of the existing carport area to provide:
  - concrete block column, lintel and balustrade at west end of carport
  - a new timber-framed deck floor, new timber posts under the existing master bedroom and a clad balustrade to the south end of the deck
- additions to the upper level to provide:
  - an extended living room
  - a new concrete floor deck over the basement
  - a new roof extending to the edge of the new deck.

2.3.3 The east addition included:

- demolition of the1966 east extension
- a large new wing to provide a new laundry and toilet and three additional bedrooms opening off a playroom.

2.3.4 Significant alterations were also made within the existing house. This included the removal of partitions to form an open-plan kitchen/dining/living area, conversion of the master bedroom wardrobe into an ensuite, and a new bathroom.

2.4 The construction of the additions

2.4.1 Construction of the basement level is specifically engineered, with a concrete slab, concrete block walls and a proprietary composite steel/concrete floor above. The remaining construction is generally conventional light timber frame, with concrete slab and foundations, stucco wall claddings, profiled metal roofing, and timber windows to match the original windows.

2.4.2 The new roofs generally have eaves of more than 600mm to the north and above the deck area, while remaining walls have no eaves or verge projections. The roof to the east addition is a multi-pitched asymmetrical gable offset on the south side, which joins the original roof with an internal gutter at the junction. At the northwest, the roof above the new deck extends as a hipped canopy supported on timber posts.

2.4.3 The expert noted no evidence of timber treatment to the exterior wall framing, but observed that balustrade framing appeared to be 'highly treated'. Given the age of the original house and the earlier additions, the majority of the existing wall framing is likely to use native and boric-treated framing. Given the date of construction of in 2002, I consider the wall framing of the additions to be untreated.

2.5 The wall claddings

2.5.1 The 1940's house walls are clad in metal mesh-reinforced stucco plaster over building wrap and spaced diagonal timber sarking. On the original north and east walls, some of the original stucco has been replaced with new metal-reinforced solid plaster while the remaining stucco has been plastered over. The walls remaining from the 1960's southwest addition are also clad in stucco applied at that time; in this instance over asbestos cement sheet backing sheets.

2.5.2 The wall cladding to the additions is a monolithic cladding system described as stucco plaster over a solid backing. In this instance it consists of 4.5 mm fibre-cement sheets fixed through the building wrap directly to the framing timbers, and covered by a slip layer of building wrap and metal mesh reinforced solid plaster. The concrete block basement walls and balustrades are plastered to match.

2.5.3 The expert was provided with a copy of a 2001 receipt for the clear water repellent coating applied to new plaster areas. I note that the manufacturer's instructions state that to 'maintain water repellence reapplication will be usually required every three years or when water repellence disappears' (see paragraph 5.2.2).

2.6 The decks

2.6.1 The west deck has a composite concrete and steel floor supported on the basement blockwork below which extends up to form a balustrade. The blockwork balustrade continues above the carport opening where it is supported on a concrete block column and lintel. The deck floor above the carport is compressed fibre-cement sheet over timber joists, with a timber-framed balustrade to the short south end of the deck. Concrete and fibre-cement substrates are coated with a fibreglass-reinforced liquid-applied membrane coating.

2.6.2 A small second deck is attached to the south laundry of the east addition. The deck is timber-framed with a spaced timber slat floor and timber steps.

3. Background

3.1 The authority issued a building consent (No. AC/01/11028) dated 31 May 2001 for the alterations under the Building Act 1991. Construction appears to have started in September 2001.

3.2 The authority's submission (refer paragraph 4.2.1) included records of the following inspections having been carried out during construction:

- concrete blockwork on 1 October 2001, which passed
- concrete slabs on 27 October 2001, which passed
- drainage on 7 November 2001, which passed except for the retention tank
- a pre-line building inspection on 25 February 2002, which passed.

3.3 The expert also noted in his report that a number of inspections had been undertaken by the authority between 21 June and 10 November 2001. The expert listed the following inspections, however I note I have not seen a copy of the inspection records:

- drainage and concrete masonry on 10 November 2001
- drainage on 1 November 2001
- insulation and preline building on 1 March 2002
- plastering on 15 May 2002

3.4 A final inspection was carried out on 29 November 2004, which identified a number of unfinished and unsatisfactory areas and noted that no pre-line drainage inspection had been carried out. No further inspections are recorded until 2009.

3.5 The notice to fix

3.5.1 The authority carried out a final inspection on 18 February 2009, which included most of the items identified in the final inspection and noted 'possible notice to fix, cladding system plaster face fixed'.

3.5.2 The authority issued a notice to fix dated 27 April 2009 with a 'photo file' of defects attached listing defects identified during its final inspection. These included in summary (with associated code clauses shown in brackets):

- lack of vertical control joints (E2)
- cladding not underlapping fascias, gutters etc (E2)
- lack of or inadequate flashings to windows and doors (E2)
- flat tops to plastered balustrades (E2)
- lack of clearances to bottom of plaster (E2)
- no coating to plaster (E2)
- no capillary gap to bottom of plaster (E2)
- unsealed bottom edges of plaster (E2)

- lack of overlap of cladding over foundation walls (E2)
- inadequate roof flashings (E2)
- reliance on sealants at roof penetrations and junctions (E2)
- lack of vermin proofing to vent pipes (G13)
- lack of coating and fixing of plywood at boxed gutter (E2)
- inadequate venting of framed chimney structure (C)
- cracking of the stucco plaster (E2)
- lack of vermin-proofing to wall vents (E3)
- unflashed and/or unsealed penetrations (E2)
- lack of handrail to exterior timber steps (F4)
- insufficient height of deck balustrades (F4)
- no confirmation of safety glass installed where needed (F2)
- cracked tile joints and junctions in bathroom (E3)
- laundry bench not sealed to walls (E3)
- lack of raised rim to gully trap (G13).

3.5.3 Under 'other building related issues', the authority also noted changes in layout to the consent drawings as well as:

- the lack of smoke alarms (C)
- the lack of a splashback to the kitchen bench (E3)
- incomplete electrical work (G9)
- confirmation of the terminal drain vent position (G13)
- blocked stormwater sump (E1).

3.6 In an email to the authority dated 5 June 2009 the applicants confirmed their intention to apply for a determination, although the Department did not receive an application until 15 March 2011.

4. The submissions

4.1 The applicants responded in detail to the items identified in the notice to fix. The intention to carry out work in response to some items was also noted along with the description of work already carried out. Some requirements in the notice were responded to by noting confirmation that identified items were provided and others seeking clarification on the requirements. The applicants also stated:

> The [builder] confirms that the building methods used were done in accordance to the consented building plans at the time. Parts of the plaster cladding system were over existing plaster on lathe installed in 1941... ...Over the last 8 years there has been no sign of leaking in either the existing house or the new additions.

4.2 The applicants forwarded copies of:

- the drawings
- some of the inspection records
- the notice to fix dated 18 February 2009
- the email correspondence with the authority on 5 June 2008.

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

- the building consent
- some of the inspection records
- records of the additions carried out during the 1960's.

4.3 A draft determination was issued to the parties for comment on 13 May 2011.

4.4 The applicants' response to the draft

4.4.1 In a letter to the Department dated 27 May 2011, the applicants declined to accept the draft determination and made a number of comments and explanations which they wanted to be taken into account. I have considered these and have amended the draft as I consider appropriate.

4.4.2 The applicants comments included (in summary):

- The original stucco to north and east walls was plastered over, not replaced.
- Although windows and doors were added, alternative bracing was discussed with the building inspector and installed at the time.
- The extension of the roof and deck was part of the original consent.
- The timber framing at the west face of the carport and the steel posts below the master bedroom were replaced with blockwork and timber posts respectively because these were unsound.
- The chimney vent was installed according to the manufacturer's specifications, and was inspected and passed by the manufacturer.
- The glass to the staircase window is safety glass (a photograph of the safety marking was attached with the submission).
- Two smoke detectors have been installed for some time.

4.5 In regards to the stucco to the north and east walls I note that the cut-out at the north living room window (see paragraph 5.4.3) revealed 'modern chicken mesh' with no sign of original stucco, indicating that at least some stucco was replaced. And regarding the extension of the roof and deck I note that the consent drawings do not show the roof abutting the chimney.

4.6 The authority accepted the draft in a response received by the Department on 21 June 2011.

5. The expert's report

5.1 As mentioned in paragraph 1.4, I engaged an independent expert to assist me. The expert is a member of the New Zealand Institute of Building Surveyors. The expert inspected the additions on 7 April 2011 and provided a report dated 19 April 2011.

5.2 General

5.2.1 The expert noted that although interior work appeared to have been carried out to a 'high standard', the stucco plaster quality 'appeared low'. The expert noted that the plaster thickness was less than required in NZS 4251[5], the plaster 'layers delaminated easily, there were many cracks and the mix was quite powdery.'

5.2.2 The expert also noted that maintenance of the house appeared 'minimal', with gutters blocked, deteriorated paintwork to timber and stained plaster claddings. The expert was provided with a copy of the 2001 receipt for the clear coating applied to the plaster (see paragraph 2.5.3).

5.2.3 The expert noted many variations from the consent drawings, which included:

- replacing some old stucco on the original north and east walls with new plaster (see paragraph 5.4.3) and over-coating the remaining on those walls
- adding more doors and windows, some of which may reduce bracing
- removing the kitchen to living room partition, which may reduce bracing
- extending the roof and deck to the east, to butt against the north chimney
- the omission of the handrail above the balustrades to the west deck
- changing the timber framing at the west face of the carport to blockwork
- replacing steel posts with timber posts below the existing master bedroom
- adding timber steps and a deck to the south laundry area
- various other internal layout changes.

5.3 The cut-outs

5.3.1 To investigate the underlying construction, the expert removed small sections of cladding ("the cut-outs") at the following locations:

- Cut-out 1: jamb to sill junction of the window in the east gable end wall.
- Cut-out 2: jamb to sill junction of the exposed north living room window.
- Cut-out 3: bottom plate under the north living room deck window.
- Cut-out 4: bottom plate under the internal gutter at the south timber deck.
- Cut-out 5: top of the plaster to the northeast deck post at the chimney.

[5] NZS 4251:1974 Code of practice for solid plastering

5.4 The windows

5.4.1 The expert noted that most timber doors were new, while windows were second-hand. Most windows in the additions and the re-plastered north wall are recessed back by about 40mm from the face of the plaster, which results in plaster projecting as a small ledge at the bottom and ends of the sills. When making Cut-out 1 and Cut-out 2, the expert observed that plaster layers delaminated easily.

5.4.2 At Cut-out 1, the expert observed that the plaster was 20mm thick, reinforced with metal mesh and extended only about 2mm over the timber jamb. Underlying metal jamb and sill flashings were visible, but the edge of the sill flashing terminated in the plaster and did not extend past the outer edge of the jamb flashing.

5.4.3 At Cut-out 2 in the re-plastered wall, the expert observed that plaster was 18 to 20mm thick and reinforced with 'modern chicken mesh', with no sign of original stucco. Heavy duty building paper covered 12mm thick diagonal boards spaced about 40mm. Metal jamb and sill flashings were visible, but the sill flashing terminated above bare timber sarking and did not extend beneath the jamb flashing.

5.5 The roofs

5.5.1 The expert noted that the roof cladding to the original house had a trapezoidal profile and had not been replaced. The remaining roofing was new corrugated profile metal, with clear corrugated panels installed above the west deck.

5.5.2 The old roofing falls to an internal gutter at the junction with the east addition gable, with plywood infill panels to the gable end wall. The gutter is lined with butyl membrane that butts against the underside of the old roofing. On the other side, the membrane extends under the plywood, which is nail-fixed through the membrane.

5.6 Cladding clearances and overlaps

5.6.1 At Cut-out 3, the expert observed that the bottom plate is on a 90mm high concrete nib and the stucco extends down to meet the deck surface. The nib is reduced to about 50mm under the deck doors, which are sheltered under the deck canopy.

5.6.2 At Cut-out 4, the expert observed that the concrete block foundation wall projected above the laundry deck level, with the stucco extended past the bottom plate to butt against the timber decking. At the east addition, the expert noted that the fibre-cement backing sheets overlap the foundation walls by at least 50mm and the stucco terminates against an aluminium angle. The paving slopes up along the east elevation to bury or meet the base angle.

5.6.3 At the re-plastered original north and east walls, the new stucco extends over the original concrete perimeter walls, with ground and paving levels raised close to or above the bottom of the plaster.

5.7 Moisture levels

5.7.1 The expert inspected the interior, taking non-invasive moisture readings; noting slightly elevated readings at the kitchen door sills and under four windows in the east

addition, which were confirmed with invasive readings. Interior invasive readings established that equilibrium moisture levels were between 10% and 12%.

5.7.2 The expert took invasive moisture readings at cut-outs, apron flashings, windows and doors and at other areas considered at risk, and noted the following:

- 27% in the bottom plate under the east kitchen window
- 21% at Cut-out 4 under the south end of the internal gutter
- 20% in the bottom plate at the north east corner of the east wing
- 19% at Cut-out 5 at the timber post to the deck roof and in the bottom plate to the north chimney
- 17% under a south bedroom window in the east addition, at Cut-out 1 and Cut-out 2 to windows and in the bottom plate beside the east kitchen doors
- 16% in the bottom plate under the south apron flashing.

5.7.3 Moisture levels above 18%, or which vary significantly from the equilibrium levels, generally indicate that external moisture is entering the structure and investigation is needed. I also note that moisture readings were taken during the autumn and are expected to increase during wetter seasons.

5.8 Commenting specifically on the external envelope, the expert noted that:

The plastered walls

- the plaster mix is 'powdery', layers are delaminating and the mesh is not fully embedded and there are no vertical control joints installed in walls beyond 4m
- there are many cracks in the cladding, particularly in the re-plastered north wall of the original house
- some penetrations through the stucco are insufficiently sealed

Clearances and overlaps

- there is no or insufficient clearances from the bottom of the stucco to most of the north and east elevations, with elevated moisture in the bottom plates
- raised ground levels and insufficient cladding clearances to re-plastered original walls have resulted in reducing ventilation of the original sub-floor
- there is no capillary gap at the bottom of the stucco, which allows moisture to 'wick up' the plaster and in some areas, overlaps over foundations are reduced
- there is also insufficient clearances from the roof to the upper cladding – at apron flashings and the framed chimney

Windows and doors

- some windows are not weatherproof, with:
  - stucco exposed beneath recessed timber sills
  - insufficient stucco cover over the timber jambs
  - sill flashings not extended under jamb flashings
  - edges of sill flashings terminating within plaster or against bare timber

- a window installed within the master bedroom south wall is incomplete and not weatherproof, with inadequate flashings, exposed framing, rusting fixings that penetrate the head flashing, a crack in the upper cladding and no gutter above

The roof claddings

- the internal gutter is blocked at the north end, the membrane lining does not extend under the original roof (which is corroding), the membrane is punctured by the plywood fixings, and the unpainted plywood panels have butt joints
- ends of apron flashings are not weathertight, with no kickouts, gutter ends embedded in plaster, missing plaster and exposed building wrap in some areas
- some other gutters and fascias are embedded in plaster, with exposed framing in some areas
- some roof penetrations rely on sealants, with no flashings provided
- some fixings of the uPVC clear panels above the deck are loose and water stains on the unpainted purlins indicate moisture ingress and possible damage

Maintenance

- the liquid-applied membrane to the west deck is deteriorating and damaged in some areas, particularly at the junction of concrete and timber framed floors
- maintenance is overdue, with deteriorating timber windows, cracks, mould growth and damage to plaster surfaces, unsealed plywood and blocked gutters.

5.9 The expert noted that his 'limited investigations to date may not have identified every issue' and made the following additional comments:

- The crack between the timber framed south balustrade and the existing master bedroom wall is unlikely to lead to moisture penetration, as the original stucco protects existing wall framing and there are no moisture signs beneath the deck.
- Given the concrete block construction of most balustrades and the tanalised timber used in the short south end, the lack of stucco clearances and falls to the tops are unlikely to lead to moisture-related problems.
- Although wall plaster butts against the west deck floor, this is unlikely to be a problem given the deck roof and the concrete nibs under most bottom plates.
- Although fibre-cement backing sheets to the sub-floor under the chimney are buried and absorbing moisture, the sub-floor framing appears to be tanalised and unlikely to be moisture-damaged.

5.10 Other Building Code clauses

5.10.1 The expert noted that some remedial work had been carried out since the notice to fix was issued. The gully trap has been raised, the bathroom areas now appear waterproof, and a sink bench splash-back has been added. The expert considered there were no outstanding surface water matters requiring attention, other than the blocked gutters noted in paragraph 5.8.

5.10.2 However, the expert noted that:

- the structural bracing and other structural changes require investigation (B1)
- the only chimney ventilation is a very small vent in the chimney floor (C)
- the laundry bench to wall junctions are unsealed (E3)
- the balustrade to the west deck is only 860mm high (F4)
- the timber steps to the laundry deck lack a handrail (F4)
- there is some incomplete electrical work and unsecured subfloor wiring (G9)
- a vent pipe terminates under the south roof overhang and another through the roof lacks vermin proofing (G13).

5.10.3 The expert also commented on the particular items identified in the notice to fix, and I have taken those comments into account in paragraph 8.1.

5.11 A copy of the expert's report was provided to the parties on 26 April 2011.

Matter 1: The external envelope

6. Weathertightness

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

6.2 Weathertightness risk

6.2.1 These alterations have the following environmental and design features, which influence their weathertightness risk profile:

Increasing risk

- the alterations are two-storeys high in part with some complex roof junctions
- the upper walls have monolithic cladding fixed directly to the framing
- some walls have no roof projections to shelter the cladding
- there is an enclosed deck and a timber deck attached to the house
- the external wall framing is unlikely to be treated to a level that provides resistance to decay if it absorbs and retains moisture

Decreasing risk

- the house is in a medium wind zone
- some wall cladding is sheltered by deep eaves
- most of the enclosed deck has a concrete floor and is sheltered under a roof.

6.2.2 Using the E2/AS1 risk matrix to evaluate these features, the elevations are assessed as having a moderate weathertightness risk rating. If details shown in the current

E2/AS1 were adopted to show code compliance, a drained cavity would be required for all elevations. However, this was not a requirement at the time of construction.

6.3 Weathertightness performance

6.3.1 It is clear from the expert's report that the stucco cladding to the additions has not been installed in accordance with NZS 4251 or to the manufacturer's instructions at the time. Taking into account the expert's report, I conclude that considerable work is required to make the additions weathertight and durable and further investigation is necessary, including the systematic survey of all risk locations, to determine the full extent of any moisture penetration, possible timber damage and the repairs required.

6.4 Weathertightness conclusion

6.4.1 I consider the expert's report establishes that the current performance of the building envelope is not adequate because there is evidence of moisture penetration into the timber framing. Consequently, I am satisfied that the alterations do not comply with Clause E2 of the Building Code.

6.4.2 In addition, the building envelope is also required to comply with the durability requirements of Clause B2. Clause B2 requires that a building continues to satisfy all the objectives of the Building Code throughout its effective life, and that includes the requirement for the house to remain weathertight. Because the cladding faults will allow the ingress of moisture in the future, the building work does not comply with the durability requirements of Clause B2.

6.4.3 Final decisions on whether code compliance can be achieved by remediation or re-cladding, or a combination of both, can only be made after a more thorough investigation of the external envelope and of the underlying timber framing. This requires a careful analysis by an appropriately qualified expert, with the chosen remedial option submitted to the authority for its approval.

6.5 I note that the Department has produced a guidance document on weathertightness remediation[6]. I consider that this guide will assist the owners in understanding the issues and processes involved in remediation work to the cladding, and in exploring various options that may be available when considering the upcoming work required to the alterations.

6.6 I note the expert's comments regarding the lack of maintenance to the house, and the consequential deterioration of some elements in this house. Effective maintenance of claddings is important to ensure ongoing compliance with Clauses B2 and E2 of the Building Code and is the responsibility of the building owner. The Department has previously described these maintenance requirements, including examples where the external wall framing of the building may not be treated to a level that will resist the onset of decay if it gets wet (for example, Determination 2007/60).

[6] Weathertightness: Guide to remediation design. This guide is available on the Department's website, or in hard copy by phoning 0800 242 243

Matter 2: The remaining Building Code clauses

7. Discussion

7.1 Taking account of the expert's report, as outlined in paragraph 5.10, I consider that the following items require attention (associated code clauses are shown in brackets):

- Investigation of the effect of the structural changes (B1)
- Confirmation of the adequacy of ventilation to the chimney (C)
- The unsealed laundry bench to wall junctions (E3)
- The inadequate height of the west deck balustrade (F4)
- The lack of handrail to the timber steps (F4)
- The incomplete electrical work and unsecured wiring (G9)
- The lack of vermin proofing to vent pipes and the termination (G13).

8. The notice to fix

8.1 Taking into account the expert's comments, the following table summarises my conclusions on items listed in the notice to fix dated 27 April 2009; referring also to the relevant code clauses and related paragraphs within this determination:

Notice to fix		**My conclusions**	**Code Clauses**	**Paragraph references**
Item	**Summarised requirement**			
2.1	**Not to manufacturer's specifications**			
a)	No vertical control joints	Remedial work required.	**E2, B2**	Paragraph 5.8
b)	Cladding not under fascias, gutters etc.	Remedial work required.	**E2, B2**	Paragraph 5.8
c)	Inadequate window and door flashings	Remedial work required.	**E2, B2**	Paragraphs 5.4 and 5.8
d)	Flat surfaces to balustrade tops	Adequate	**E2, B2**	Paragraph 5.9
e)	Lack of clearances to bottom of plaster	Remedial work required	**E2, B2**	Paragraphs 5.6 and 5.8
f)	Lack of coating to plaster	Maintenance required	**E2, B2**	Paragraphs 2.5.3 and 5.8
g)	Lack of capillary gap to cladding base	Remedial work required	**E2, B2**	Paragraphs 5.6 and 5.8
h)	Unsealed bottom edges of plaster	Remedial work required	**E2, B2**	Paragraphs 5.6 and 5.8
i)	No cladding overlap at bottom	Remedial work required	**E2, B2**	Paragraphs 5.6 and 5.8
2.2	**Not to relevant code requirements at the time**			
a)	Inadequate apron flashings	Remedial work required	**E2, B2**	Paragraphs 5.5 and 5.8
b)	Reliance on sealants at roof junctions	Remedial work required	**E2, B2**	Paragraphs 5.4 and 5.8
c)	Lack of vermin proofing to vent pipes	Remedial work required	**G13**	Paragraph 5.10.2
d)	Uncoated plywood at gutter	Remedial work required	**E2, B2**	Paragraph 5.5.2 and 5.8
e)	Cladding not under fascias, gutters etc.	Remedial work required.	**E2, B2**	Paragraph 5.8
f)	Inadequate venting of chimney	Remedial work required	**C**	Paragraph 5.10.2
g)	Cracks to cladding	Remedial work required	**E2, B2**	Paragraph 5.8
h)	Lack of coating to plaster	Maintenance required	**E2, B2**	Paragraphs 2.5.3 and 5.8
i)	No vermin-proofing to fan outlets	Adequate		Paragraph 5.10.1
j)	Unflashed and/or unsealed penetrations	Remedial work required	**E2, B2**	Paragraphs 5.8
k)	Inadequate window and door flashings	Remedial work required.	**E2, B2**	Paragraphs 5.4 and 5.8
l)	Inadequate head flashings	Remedial work required.	**E2, B2**	Paragraphs 5.4 and 5.8

Notice to fix		My conclusions	Code Clauses	Paragraph references
Item	**Summarised requirement**			
m)	No handrail to external timber stairs	Remedial work required	**F4**	Paragraph 5.10.2
n)	Insufficient height of clad deck balustrades	Remedial work required	**F4**	Paragraph 5.10.2
o)	Confirmation of safety glass needed	Confirmation provided	**F2**	Paragraph 4.4.2
p)	Cracked tile joints/junctions in bathroom	Adequate	**E3**	Paragraph 5.10.1
q)	No sealing to laundry bench junctions	Remedial work required	**E3**	Paragraph 5.10.2
r)	Lack of raised rim to gully trap	Adequate	**G13**	Paragraph 5.10.1
2.3	**Not to accepted trade practice**			
a)	Cladding not under fascias, gutters etc.	Remedial work required.	**E2, B2**	Paragraphs 5.8
b)	Lack of clearances to bottom of plaster	Remedial work required	**E2, B2**	Paragraphs 5.6 and 5.8
c)	Inadequate roof flashings	Remedial work required	**E2, B2**	Paragraphs 5.5 and 5.8
d)	Reliance on sealants at roof junctions	Remedial work required	**E2, B2**	Paragraphs 5.5 and 5.8
e)	No vermin-proofing to vents	Adequate	**E3**	Paragraphs 5.5 and 5.8
f)	Unflashed and/or unsealed penetrations	Remedial work required	**E2, B2**	Paragraph 5.8
g)	Inadequate window and door flashings	Remedial work required.	**E2, B2**	Paragraphs 5.4 and 5.8
h)	Inadequate head flashings	Remedial work required.	**E2, B2**	Paragraphs 5.4 and 5.8
i)	Lack of raised rim to gully trap	Adequate	**G13**	Paragraph 5.10.1
2.4	**Drainage and ventilation**			
	Lack of cladding drainage & ventilation	Investigation required	**E2, B2**	Paragraphs 6.4.3 and 9.1
3.0	**Other building related issues**			
a)	Smoke detectors	Not required at time	**C**	Paragraph 4.4.2
b)	No splashback to the kitchen bench	Adequate	**E3**	Paragraph 5.10.1
c)	Incomplete electrical work	Remedial work required	**G9**	Paragraph 5.10.2
d)	Terminal drain vent position	Remedial work required	**G13**	Paragraph 5.10.2
e)	Blocked stormwater sump	Adequate	**E1**	Paragraph 5.10.1

8.2 I note that the authority's photo file attached to the notice to fix identified defects in the existing stucco and metal roofing. Where these areas are unchanged and do not intersect with the new work, the identified defects are not part of the subject building work considered in this determination. However, it is apparent that some existing claddings are showing severe deterioration and I strongly urge the owners to undertake appropriate maintenance.

8.3 I am satisfied that the alterations do not comply with the Building Code and that the authority made an appropriate decision to issue the notice to fix. However, I am also of the view that some items identified in the notice are likely to be adequate and I have also identified additional items that need to be addressed, so the notice should be modified accordingly (refer to paragraph 9.2).

9. What is to be done now?

9.1 I note that the notice to fix required provision for adequate ventilation and drainage. Under the Act, a notice to fix can require the owner to bring the additions into compliance with the Building Code. The Building Industry Authority has found in a previous Determination (2000/1) that a notice to rectify (the equivalent to a notice to

fix under the Building Act 2004) cannot specify how that compliance can be achieved. I concur with that view.

9.2 The notice to fix should be modified to take account the findings of this determination, identifying the items listed in paragraph 5.8 and paragraph 7.1 and referring to any further defects that might be discovered in the course of investigation and rectification, but not specifying how those defects are to be fixed. It is not for the notice to fix to stipulate directly how the defects are to be remedied and the house brought to compliance with the Building Code. That is a matter for the owner to propose and for the authority to accept or reject. It is important to note that the Building Code allows for more than one means of achieving code compliance.

9.3 I suggest that the parties adopt the following process to meet the requirements of paragraph 9.2. Initially, the authority should revise and reissue the notice to fix. The applicants should then produce a response to this in the form of a detailed proposal for the house as a whole, produced in conjunction with a competent and suitably qualified person, as to the rectification or otherwise of the specified matters. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

9.4 I also note that the expert has identified many changes from the consent drawings, some of which may affect structural compliance and therefore require further investigation. In regard to the other changes, I leave these to the parties to resolve once the appropriate remedial work is satisfactorily completed.

10. The decision

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

- there is insufficient evidence to establish on reasonable grounds that structural changes comply with Building Code Clause B1 or that the chimney ventilation complies with Building Code Clause C
- the external envelope does not comply with Building Code Clauses B2 and E2
- the additions and alterations do not comply with Clauses E3, F4 and G13 of the Building Code

and accordingly the authority is to modify the notice to fix, dated 27 April 2009, to take account of the findings of this determination.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 24 June 2011.

John Gardiner
Manager Determinations