Determination 2016/020

The refusal to issue a code compliance certificate for an 8-year-old house at 162 Mahurangi West Road, Puhoi, Warkworth

Summary

This determination considers the authority's decision to refuse to issue a code compliance certificate for a house; the authority's concerns were chiefly to do with the weathertightness and durability of the exterior envelope. The determination discusses the authority's reasons for the refusal, and whether there was sufficient evidence of compliance in order to issue a code compliance certificate.

1. The matter 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 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, R Pallesen ("the applicant")
- Auckland Council ("the authority")[2], carrying out its duties as a territorial authority or building consent authority.

1.3 This determination arises from the decision of the authority to refuse to issue a code compliance certificate for an 8-year-old house because it was not satisfied that the building work complies with the requirements of the building consent documents and certain clauses[3] of the Building Code (First Schedule, Building Regulations 1992).

[1] The Building Act, Building Code, compliance documents, past determinations and guidance documents issued by the Ministry are all available at www.building.govt.nz or by contacting the Ministry on 0800 242 243.
[2] Before the application was made, Rodney District Council was transitioned into Auckland Council; "the authority" is used for both.
[3] Unless otherwise stated, references to sections are to sections of the Act and references to clauses are to clauses of the Building Code.

The authority's concerns about the compliance of the building work relate primarily to the weathertightness and durability of the exterior claddings.

1.4 The matter to be determined[4] is therefore the authority's exercise of its powers of decision in refusing to issue the code compliance certificate for the reasons set out in its letter dated 1 October 2015 (refer paragraph 3.6).

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

2. The building work

2.1 The building work consists of a detached house that is two storeys high in part and is situated on an excavated rural site in a very high wind zone[5] as set out in NZS 3604[6]. The site has a steep slope down to the south east behind the house, with the building platform having a gentler slope of about 1.5m across the house footprint.

2.2 The house is fairly complex in plan and form, with some complex junctions, and is assessed as having a medium to high weathertightness risk. An elongated single-storey central section links two-storey wings to the east and west, with the following accommodation provided:

- Central section:
  - open-plan living, dining and kitchen area
  - a large deck and pool area along the south
  - an office at the north west corner.
- East wing:
  - two bedrooms and bathrooms in the lower level
  - master bedroom, bathroom and living area in the upper level
  - a partly cantilevered deck from the living room north wall.
- West wing:
  - a single-storey glazed entry link to the rest of the house
  - garage and laundry in the lower level
  - bedroom, bathroom and a small living room in the upper level
  - a deck from the living room east wall.

2.3 The construction is specifically engineered, with a glue-laminated timber post and beam structure supported on concrete piles, timber infill framing between portal frames, timber framed floors and roofs, and timber framed interior partitions. The consent drawings include a typical external wall detail for infill framing between portal frames, which shows ex 150mm x 50mm framing, with a 9mm plywood 'rigid air barrier' that also provides bracing beneath the building wrap.

2.4 The specification called for the portals to be treated to H3.2 and the typical external wall detail includes handwritten notes that infill framing is also H3.2 treated. The expert also noted that the authority passed treatment levels during preline

[4] Under sections 177(1)(b) and 177(2)(d) of the Act.
[5] According to consent documentation.
[6] New Zealand Standard NZS 3604:1999 Timber Framed Buildings.

inspections. Given that evidence and the date of construction, I consider that the external framing is treated to a level that will provide resistance to fungal decay.

2.5 The roofs

2.5.1 The 7° monopitched roofs are profiled metal set at various levels, with eave projections deeper than 600mm overall and no verge overhangs to the two-storey high roofs. On the east wall of the east wing, a two-storey section ("the east bay") projects out from the main wall, with a flat membrane roof and a parapet capping.

2.5.2 In the east wing, the east wall continues as a 2.4m wing wall on the north east corner; extending to meet the oblique eave overhang where the monopitched roof rises to create, in effect, a three-storey high north elevation. Similar wing walls extend to meet eaves at the south east and south west corners.

2.6 The wall claddings

2.6.1 The single-storey central section and the two-storey east bay are clad in rusticated timber weatherboards fixed through vertical cavity battens, the building wrap and the plywood air barrier to the timber framing. The weatherboards to the two-storey east bay extend up to a capped parapet at the edge of the flat membrane roof.

2.6.2 The remaining walls are clad in vertical cedar shiplap weatherboards and horizontal cavity battens are specified in the drawings. Based on the limited details and the photographs, the cladding appears to be a proprietary cedar cladding system, which in this instance consists of 19mm thick shiplap vertical weatherboards fixed through a layer of building wrap, horizontal battens, the building wrap and the plywood air barrier to the timber framing. Battens include 7mm deep staggered drainage grooves to both sides. The cladding manufacturer's technical information includes recommended details for windows, edges and other junctions.

2.7 The decks and pool

2.7.1 The ground floor includes a large timber framed deck to the south of the central section, which extends to a swimming pool to the south. The southern side of the pool forms an 'infinity edge', with a glazed panel set into the top of the concrete pool wall. The pool and surrounds are separated from the remaining deck with a glazed barrier.

2.7.2 The east wing includes a north deck from the upper master bedroom living area. The deck floor comprises removable timber slat panels that sit on top of an underlying membrane which drains to a downpipe at the outer corner. The membrane is turned up at the wall and against the metal-capped parapet nib, with metal and glass balustrades side-fixed to the outer face of a fascia board.

2.7.3 The west wing includes an angled deck from the west wall of the upper living room, which is similar in construction to the east wing deck. However, the building surveyor's report (see paragraph 3.5.3) and the expert's investigations (see paragraph 5.7.1) have revealed that only part of the west wing deck includes an underlying membrane below the removable timber panels.

3. Background

3.1 The authority issued building consent no. ABA- 62873 to the applicant on 11 May 2007. Construction appears to have been carried out in three stages, with the central section and east wing substantially completed by early 2008, the west wing by about May 2008 and the pool by the end of 2009.

3.2 The authority carried out various inspections of the central section and east wing in 2007 including pre-line and wrap inspections in September and November, cavity battens in October and wet area membrane in December 2007. Inspections of the west wing included pre-line, wrap and cavity batten inspections in February 2008, with the last inspection recorded for the upper deck to the west wing on 5 May 2008.

3.3 The 2009 refusal to issue a code compliance certificate

3.3.1 The authority's inspection summary records a final inspection on 11 December 2009. The summary lists 12 items to be completed along with amended drawings to record the planning and material changes during construction. The authority wrote to the applicant on 23 December 2009 and refused to issue a code compliance certificate due to these outstanding items.

3.3.2 The authority listed the outstanding items and stated that a further inspection would be required when the work was complete, adding that it was 'possible that new matters may arise during a repeat inspection.' A re-inspection on 12 September 2012 ticked off all incomplete items except for the completion of the pool fencing.

3.4 The 2015 inspections

3.4.1 The authority carried out a number of inspections and site visits during 2015. The first on 23 April 2015 identified only one non-compliant item, which was subsequently resolved. Pool fencing was inspected and passed on 27 July 2015.

3.4.2 The authority visited the site on 13 August 2015 to 'assess visually membrane decks and roof to wall junctions.' The authority took photographs and non-invasive moisture readings; noting concerns about the upper deck to the west wing along with a number of elevated readings. The inspection record noted that the property file and photographs needed to be reviewed.

3.5 The building surveyor's report

3.5.1 The applicant subsequently engaged a building surveyor to carry out a limited inspection 'looking mainly at the decks and adjacent/associated junctions as these were the initial areas of concern as highlighted' by the authority. The surveyor inspected the upper decks, reporting to the owner on 25 August 2015.

3.5.2 The surveyor noted that the decks had been changed from an open timber slat deck to an enclosed deck with plywood sheet laid over the joists and a soffit lining. Deck boards were overlaid, with the plywood waterproofed with a liquid applied membrane.

3.5.3 In regard to the upper decks, the surveyor noted (in summary):

- only the perimeter of the substrate to the west deck had been waterproofed
- the east wing deck was waterproofed, but appeared to have only an initial coat
- the deck/wall and parapet capping/wall junctions appeared vulnerable.

3.5.4 The surveyor considered that repairs would include (in summary):

- remove and refit deck boards, cappings, windows and doors, and some weatherboards
- check and repair substrates and balustrade fixings
- install compliant falls, overflows, outlets and step-downs
- install new waterproof membranes
- check balustrade fixings
- replace floating timber decking, cappings
- refit windows and doors and make good weatherboards.

3.5.5 The surveyor also identified concerns regarding the opening to the east end wing wall and the lack of drainage gaps above the garage door flashing; noting also that a building consent would likely be required for the deck repairs.

3.6 The 2015 refusal to issue the code compliance certificate

3.6.1 The authority re-inspected the house on 28 September 2015 and the 'durability final inspection' record identified a number of concerns and noted that the building work may not comply with some clauses of the Building Code. The record also noted:

> Cladding clearance
> Compliance of cladding installation with manufacturers specifications
> Membrane decks
> Moisture readings
> Roofs not inspected
> Peer review to complete...

3.6.2 The authority wrote to the applicant on 1 October 2015 to advise that 'under Section 95A of the Building Act 2004 a [code compliance certificate] cannot be issued at this stage.' The authority stated that:

> 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.

3.6.3 The authority recommended that:

> ... you engage the services of a suitably qualified individual (building surveyor) who is qualified in Weather Tight assessment and Remedial Design.
>
> 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.
>
> Note: Please do not commence any remedial work until approved by [the authority], this work may require an application for a new building consent.

3.6.4 The authority listed the identified areas of concern (in summary with the associated clauses in brackets):

- Item 1: Roofs
  - deflection to central section roof (B1)
  - solar panels to central section roof not in consent
  - apron flashings stop ends (E2)
  - lack of access to inspect roofs (E2)

- Item 2: Weatherboards
  - horizontal boards not in consent
  - cladding clearances and coverage (E2)
  - black boards cupping and splitting in places (E2)
  - lack of access to inspect claddings above roofs (E2)
  - flashing falls (E2)
  - sill flashing to east elevation (E2)
  - vertical shiplap junction with timber fascias/soffits (E2)
- Item 3: Unsealed junctions to laundry joinery (E2)
- Item 4: Deterioration to glazing gaskets (E2)
- Item 5: Subfloor ventilation (E2)
- Item 6: Upper membrane decks
  - membrane incomplete (E2)
  - unable to review falls, membrane condition, thresholds (E2)
  - capping junctions (E2)
  - gaps to glazed barriers (F4)
- Item 7: Interior
  - elevated moisture levels (E2)
  - cracks, tears to some linings (B1)
  - movement around laundry door (B1)
  - nail creep (B1)
  - stains to bathroom sealing (E3)
  - unsealed wall board under vanity (E3)
  - lack of bathroom window restrictors (F4)
  - lack of handrails (D1)
  - smoke alarms (F7)
  - lack of fall to kitchen basin waste pipe (G13)
- Item 8: Deformation of planter retaining wall (B1)
- Item 9: Cracks to pool glass (F4)
- Item 10: Pool fence not to consent documents (F4)
- Item 11: Inadequate as-built drawings.

3.6.5 The authority also listed outstanding documentation and stated that:

> Further investigation & scope of work report is to be received & approved prior to any remedial work being undertaken. Failure to comply with this request may affect [the authority's] ability to issue a code compliance certificate.

3.7 The Ministry received an application for a determination on 27 November 2015 and sought further information from the parties, which was received by 6 February 2016.

4. The submissions

4.1 The applicant made no submission with the application but provided copies of:

- the consent drawings
- the building consent
- some inspection records from 2012 to 2015
- an application for modification of durability provisions dated 8 September 2015
- the building surveyor's report dated 25 August 2015
- various other statements and information.

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

- the consent documentation
- the amended floor plans stamped 'minor variation' on 7 December 2012
- the inspection records and summaries
- the authority's refusal to issue a code compliance certificate dated 23 December 2009
- correspondence with the applicant
- the authority's refusal to issue a code compliance certificate dated 1 October 2015
- various producer statements, photographs and other information.

4.3 A draft determination was issued to the parties for comment on 3 May 2016. The authority accepted the draft without comment on 12 May 2016.

4.4 The applicant accepted the draft on 23 May 2016, but requested that paragraphs relating to the ongoing maintenance be removed. I have amended the paragraphs but not removed them in their entirety.

5. The expert's report

5.1 As mentioned in paragraph 1.5, I engaged an independent expert to assist me. The expert is a member of the New Zealand Institute of Architects and inspected the house on 23 February and 11 March 2016. A report was received on 12 April 2016, and sent to the parties on 14 April 2016.

5.2 General

5.2.1 The expert noted that the scope of his inspection was to provide an opinion about items identified in the authority's letter of refusal dated 1 October 2015 and to assess code compliance of the building with the associated parts of Clauses B1, B2, D1, E2, E3, F4, F7 and G13 as identified by the authority.

5.2.2 The expert noted that only two revised floor plans were submitted as a 'minor variation' to show various plan changes. However, approved changes had not been carried through to the associated elevations, sections and details, which resulted in

'some ambiguity as to what consented.' Taking this into account, the expert noted the following changes from the consent drawings:

- Prefabricated timber I-beams to floors and roof framing between glulam portal framings replaced with solid timber.
- Most windows and doors changed in configuration and location.
- Upper decks to east and west wings changed from open timber decking to membrane with removable timber slat panels above.
- Balustrade glass fixed to stainless steel posts in lieu of the channel fixing shown in the drawings.
- Elevations have not been updated to show plan changes, which include:
  - changes to entry doors, steps etc
  - stairs from entry to garage level
  - changes to south deck and pool area.
- Vertical shiplap replaced with horizontal weatherboards on walls to central section and the two-storey east bay.
- Glass strip added to the 'infinity edge' of the pool.
- Upper deck to west wing extended and angled from wing wall.
- Various other minor changes.

5.3 Moisture testing and destructive investigations

5.3.1 The expert inspected the interior, observing that the internal linings were generally 'free from mould, stains, swelling or other clear signs of moisture ingress'. Apart from two ceiling areas described below, the expert considered that other cracks and defects to lining surfaces were almost certainly installation faults rather than as a result of moisture ingress or structural movement.

5.3.2 The expert observed the following signs of moisture penetration in two areas:

- mould and stains on the closet ceiling beneath the flat membrane roof to the east wing bay
- swelling and stains on the central section living room ceiling below fixings to the roof-mounted solar panels.

5.3.3 The expert assessed the areas of concern identified by the authority and limited his invasive testing to those areas. The expert took invasive moisture readings using long probes from the inside at sample locations on the south elevation considered at-risk and recorded readings of 13% to 15% in framing at bottom plate to first floor, sill plate, bottom of stud at ground floor and stud at lower deck level. Both of the invasive moisture readings into the upper deck framing were elevated as follows:

- over 18% at corner of boundary joist of north deck to east wing
- 27% at north end of boundary joist of west deck to west wing.

5.3.4 Readings over 18% generally indicate that moisture is entering the framing and further investigation is needed. The expert also noted that his investigation was carried out in summer and readings therefore represented the low point of expected seasonal variation, with higher readings expected during wetter winter months. The expert noted that the elevated upper deck readings on the north and west elevations

indicated 'moisture ingress at a level which does not dry out completely', despite the dry season and the orientation.

5.3.5 The expert noted a swollen joint beneath the east window jamb to the upper floor west wing bedroom, which he considered to be an exposed and high risk location. In order to investigate the condition of the underlying timbers, the expert removed the panel of lining below the sill, noting that the plasterboard had not been firmly fixed and the joint could be moved under thumb pressure. The expert found no evidence of past or present moisture penetration, with no staining or water marks to the framing and plywood air barrier.

5.4 The wall claddings

5.4.1 The expert noted that the sub-floor area on the east elevation was closed off with spaced boards fixed to jack studs. Elsewhere, weatherboards extended past decking or plinths constructed in a similar way, with a 10mm gap allowing drainage through the decking or into drainage channels at the garage slab. The base details generally complied with the consent and appeared satisfactory.

5.4.2 The expert observed that timber caps had been installed at external corners to the shiplap boards. A photograph taken during construction showed metal back flashings and the authority's inspection records noted that stainless steel back flashings were being installed. From below the pool deck, the expert was also able to observe a backflashing to an internal corner. (I note that these details accord with the shiplap manufacturer's specifications.)

5.4.3 The expert noted that the vertical shiplap cladding had been installed on high risk elevations, although in the Acceptable Solution E2/AS1 such cladding is restricted to low risk walls. The expert was unable to verify that the horizontal cavity battens used for the cladding had been independently appraised as suitable for such applications.

5.4.4 However as outlined in paragraph 5.3.5, the result of the destructive investigation into a high risk location indicated that similar walls around the house had performed satisfactorily to date. Notwithstanding the lack of evidence of failure to comply, the expert considered it would be prudent to commission periodic moisture testing during winter when moisture readings are expected to peak.

5.5 Windows and doors

5.5.1 The expert inspected joinery installed in weatherboard walls and noted:

- joinery is face-fixed against boards, with metal head flashings and sealant behind jamb flanges but no scribers (in contrast to the E2/AS1 detail for rusticated weatherboards)
- the sill flange overlaps the weatherboards, allowing a drainage gap
- shiplap boards are tightly butted against the head flashing in some locations, with no allowance for drainage from the upper cladding.

5.5.2 The expert noted that although there is no evidence of moisture penetration associated with the window installation to date, the lack of drainage from the cavity to the high risk shiplap cladding above some exposed head flashings risks moisture being trapped within the cavity and battens.

5.5.3 Based on the proprietary system likely to have been used for the shiplap cladding (see paragraph 2.6.2), I note that the manufacturer's recommended details include:

- seal beneath jamb flange and 18mm scriber sealed to the board
- 5mm drainage gap between angled bottom edge of boards and the top of the head flashing.

5.6 The roofs

5.6.1 The expert inspected the roofs and noted that roof/wall junctions appeared satisfactory. Apron flashings were fitted, with kickouts at the bottom and cladding clearances of about 35mm. The expert noted that the details generally accorded with E2/AS1 and with the consent drawings. However, the expert noted unsealed fixings to the solar panel above the leak to the lounge ceiling.

5.6.2 The soffit/wall junction at oblique eaves appeared to accord with the consent drawings, with a flashing fitted at the junction. However for the several verge overhangs where junctions align with the roof slope, no flashing or cover bead[7] had been fitted. Given the very high wind zone, the expert recommended that a cover bead be fitted to protect against the possibility of future moisture ingress.

5.6.3 The expert also inspected the flat membrane roof to the east bay and noted:

- evidence of ponding above the vicinity of the leak into the closet below
- substrate joints visible and fibreglass reinforcing were clearly visible, indicating a lack of resin and likely poor preparation
- insufficient turn-up at the perimeter
- insufficient cladding clearance to the top of the parapet capping.

5.7 The upper decks

5.7.1 The expert was able to inspect the underlying membrane below the timber slat panels to the upper decks. For the deck to the west wing, the expert noted:

- a limited fall of 0.3^{o} compared with recommended 1.5^{o}[8]
- missing areas of membrane, with primed plywood visible
- visible fibreglass indicates insufficient resin application
- insufficient upstand at the doors
- elevated moisture levels in boundary joist
- some isolated staining at the edge of the soffit.

5.7.2 I note that the deck to the east wing is constructed in a similar manner and is expected to have similar defects in the membrane application, upstands and falls, with elevated moisture levels also recorded at the corner of the boundary joist.

5.7.3 The expert also measured the gaps at the ends of the glazed balustrades and noted that these exceeded the 100mm maximum of F2/AS1.

5.8 The authority's list of concerns

5.8.1 The expert also assessed the list of concerns identified by the authority in its S95A refusal to issue a code compliance certificate; and Table 1 summarises the expert's responses. I have added comments in brackets where I consider appropriate.

[7] As per E2/AS1 Figure 8A b) – 2011 amendment.
[8] Compared with 1.5^{o} recommended in BRANZ Good Membrane Practice Guide.

Table 1

Areas of concern per S95A refusal		Expert's comments
1	**Roofs**	
a	Excessive deflection to north roof	• Mid-span deflection measured at about 24mm. • Independent engineering calculations of creep deflection gives total expected mid-span deflection of 31mm max. • Roofing and lining free from associated damage. • Calculations and lack of evidence of stress indicate adequate roof framing.
b	Solar panel to north roof not in consent	Agreed. Evidence of panel fixings causing leak below.
c	Stop ends to apron flashings	• Stop ends generally similar to E2/AS1 kick out detail. • No evidence of associated moisture penetration. • Detail likely to have been referred to by authority was neatly formed and low risk, but could benefit from sealant at the return.
d	Lack of access to roof	All roof areas accessed during assessment. Only roof defects identified were for the flat membrane roof to the east bay (see paragraph 5.6.3).
2	**Timber weatherboards**	
a	Horizontal weatherboards not in consent drawings	Agreed.
b	Insufficient cladding clearances	Agreed (only for clearances above some head flashings).
c	Cladding coverage	Not clear what is referred to.
d	Horizontal black weatherboards cupping	Agreed – some boards cupped, particularly on north elevation. Dark colour has increased movement of boards, but risk of moisture ingress mitigated by: • roof overhang • drained cavity to low risk elevation. Repainting with lighter colour recommended, but damage unlikely to lead to non-compliance.
e	Horizontal black weatherboards splitting on north elevation	North elevation – refer d) above. Two split boards on east elevation where boards have slots for head flashings, but no associated moisture penetration.
f	No access to upper cladding	All roof areas accessed during assessment. Visible details generally accord with consent and appeared adequate.
g	Falls to flashings	Parapet flashing to bay roof inadequate. Elsewhere – flashings generally divert water away from building.
h	Sill flashing to east opening fitted post construction.	Unsure what opening is referred to or whether there was a problem - could identify no window sill flashing. (may be opening to east wing wall, identified as a risk in building surveyor's report – see paragraph 3.5.5).
i	Shiplap to fascia junction	(Unclear whether refers to verge fascias or soffit junctions) Flashings installed at oblique soffit/wall junctions, but not at verge soffits (see paragraph 5.6.2).
3	**South laundry door/window not sealed to cladding**	• metal closer insert piece between door and window jambs • insert has hooks behind jamb flanges, but no sealant • recommend installing sealant in view of exposure.

Areas of concern per S95A refusal		Expert's comments
4	**Glazing rubbers shrinking**	Gaskets generally satisfactory, except for: • 70mm gap at top of sliding doors above garage • A ground floor bedroom slider, where a gasket is loose and requires maintenance.
5	**Sub-floor ventilation**	Adequate in circumstances: • spaced boards and gaps to deck boards at east and most of south elevations, with daylight evident from subfloor • west wing has limited ventilation due to garage slab side, but sub-floor lacked any sign of associated dampness as a result.
6	**The upper decks** Items a) to f)	Investigation and repairs required (see paragraph 5.7).
7	**Interior**	
a	Elevated moisture readings	Except for ceilings under leaks (see paragraph 5.3.2), all readings uniformly low. Confirmed by low invasive readings at four sample high-risk locations.
b, c	Cracks and tears to linings indicate movement	Likely due to drying shrinkage or fixing defects. Some plasterboard not properly fixed. No evidence of undue movement and unlikely to affect compliance (linings not used as bracing).
d	Signs of movement to laundry floor	Fine crack between door liner and floor almost certainly due to drying shrinkage or fixing defects – unlikely to affect compliance.
e	Nail creep in laundry area	Not evident.
f	Stains to sealant in bathroom	Maintenance issue – unlikely to affect compliance.
g	Unsealed wall board beneath vanity	Wallboard exposed when vanity replaced. Maintenance issue – unlikely to affect compliance.
h	Lack of window restrictors to upper bathroom window	Agreed.
i	Lack of handrails	Agreed – for west wing stairs from entry.
j	Smoke alarms missing	Agreed – for ground floor bedrooms and west wing bedroom.
k	Fall to kitchen wastepipe	Agreed – waste is flat.
8	**Planter retaining wall deforming**	Timber planter wall not part of consent so not an issue for code compliance certificate.
9	**Cracks to pool glass**	Agreed – requires investigation and replacement.
10	**Pool fence changed from consent**	System changed to metal feet and braces. (Pool fence separately inspected and passed on 27 July 2015).

5.9 Other items noted

5.9.1 The expert also reviewed the documentation provided for the construction, recommending 'review of the following issues':

- glass balustrade design
- revised as-built drawings
- peeling paintwork to timber scribers
- completion of producer statements, or waiver of requirement where adequate performance in use has been demonstrated (or where product has failed).

5.10 Summary

5.10.1 Taking account of items identified during his assessment of the house, the expert concluded that the following areas required further investigation and/or remedial work in regard to Clauses E2 and B2 of the Building Code:

- alterations/repairs to the upper floor decks
- alterations/repairs to the east bay membrane roof and parapets
- repairs to solar panel fixings over lounge
- the lack of drainage gaps above some exposed head flashings
- minor maintenance/repairs:
    - inspection and repairs to some jamb sealants
    - sealant to east roof flashing at west wing upper wall/entry roof junction
    - glazing gasket with gap in door above garage – requires replacement
    - loose gasket to east wing lower bedroom north door.

5.10.2 The expert also noted a number of other areas requiring maintenance or consideration. In particular, the expert recommended the following be considered as 'prudent' measures in order to reduce potential risks of possible future problems:

- periodic moisture testing during winter periods
- addition of cover bead to verge overhangs
- painting black weatherboards with light-reflective colour to reduce movement.

5.10.3 Assessing the remaining concerns identified by the authority, the expert concluded that the following items required attention (with associated clauses in brackets):

- excessive gaps at ends of the upper deck balustrades (F4)
- lack of window restrictor to upper bathroom window (F4)
- lack of handrails to west wing stairs from entry (D1, F4)
- cracks and damage to pool infinity edge glass strip (F4)
- lack of smoke alarms near bedrooms (F7)
- flat section of kitchen waste pipe (G13).

6. Discussion

6.1 General

6.1.1 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. In order to determine whether the authority correctly exercised its power in refusing to issue a code compliance certificate for this house, I must consider whether the building work complies with the building consent.

6.1.2 When considering compliance of work with the building consent there will be instances where consent documentation lacks all the details required to establish compliance with the Building Code. In this case changes to the building work during construction have been noted by the authority and the expert, and there is a lack of clarity in some consent documents and a large number of variations from the approved plans.

6.1.3 There will often be minor variations from the consent documents and the authority should always be informed of these so that a proper process for dealing with the changes can be established. 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, the authority considered that the variations were not of such a significant level that they warranted a formal amendment of the building consent.

6.1.4 The authority's pre-line inspection records refer to the need for amended plans for all changes from the building consent; indicating the authority's awareness and acceptance of most, if not all, of the changes. Two amended drawings were submitted after the house was completed and were stamped 'minor variation' on 7 December 2012. However, these two drawings were insufficient to fully address the implications of the changes and also did not include many of the other changes identified by the expert. There are many variations in the as-built house from the consent drawings (see paragraph 5.2.2), and I leave appropriate documentation of those changes to the parties to resolve once all outstanding matters are resolved.

6.1.5 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. I am of the view that I am also able to consider evidence that may come to light during the determination process, if that evidence helps to establish the compliance of the building work.

6.2 Compliance of the external building envelope

6.2.1 The expert has identified a number of areas where the claddings do not comply with the building consent (see paragraph 5.2.2) and the following paragraphs consider the compliance of the external building envelope with Clause E2 External moisture and Clause B2 Durability. The building envelope includes the components of the systems (such as the weatherboard claddings, the windows and the roof cladding) as well as the way the components have been installed and work together.

6.2.2 I note that the owner has applied to the authority for a modification of durability provisions to allow the durability periods specified in Clause B2.3.1 to commence from the date of substantial completion in 2008. Although I leave this matter to the

parties to resolve in due course, I have taken the anticipated modification into account when considering the durability of the claddings.

6.2.3 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).

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

Increasing risk

- the house is two-storey high in part and is in a very high wind zone
- the house is complex in plan and form, with some complex junctions
- the house has two enclosed upper decks
- two-storey high verges and the east bay have no roof overhangs
- some eaves are oblique, limiting their effective shelter
- the vertical shiplap is fixed over horizontal cavity battens with limited drainage

Decreasing risk

- there are generous eaves to shelter some of the walls
- the horizontal weatherboards are fixed over drained cavities
- the external wall framing is treated to a level that provides sufficient resistance to decay if it absorbs and retains moisture.

6.2.5 Using the E2/AS1 risk matrix to evaluate these features, the single-storey central section generally has a low to moderate risk rating. However, the elevations of the east and west wings are assessed as having a high weathertightness risk rating.

6.2.6 If current E2/AS1 details were adopted to show code compliance, the vertical shiplap weatherboards would not be permitted as cladding to the high and moderate risk walls. The shiplap cladding to this house must therefore be considered as an alternative solution.

Weathertightness performance

6.2.7 I note that the vertical shiplap cladding system appears to generally be installed in accordance with the likely manufacturer's details at the time of installation. Most of the other claddings also appear to have been installed in accordance with good trade practice and/or relevant manufacturers' instructions.

6.2.8 Apart from the upper membrane decks and the membrane roof to the east bay, the house appears to have remained weathertight since completion, but the expert has identified some other areas that require attention. Taking account of the expert's report and the other photographs[9], I therefore consider that the areas identified in paragraph 5.10.1 require further investigation and repair.

Weathertightness conclusion

6.2.9 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 several areas of timber framing. Consequently, I am satisfied that the house currently does not comply with Clause E2 of the Building Code.

[9] Including photographs taken by the architect during construction, the building surveyor, and the authority at its final inspection.

6.2.10 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 for the house to remain weathertight. The durability requirements of Clause B2 include a requirement for claddings to remain weathertight for a minimum of 15 years. Because some cladding defects are allowing moisture penetration or are likely to do so within the remaining durability period, I am therefore satisfied that the claddings do not comply with the durability requirements of Clause B2.

6.2.11 Because the identified moisture penetration and cladding faults occur in discrete areas, I am able to conclude that satisfactory investigation and rectification of areas outlined in paragraph 5.10.1 will result in the house being brought into compliance with Clauses E2 and B2 of the Building Code.

6.2.12 It is emphasised that each determination is conducted on a case-by-case basis. Accordingly, the fact that a particular cladding system has been established as being code-compliant in relation to a particular building does not necessarily mean that the same cladding system will be code-compliant in another situation.

On-going maintenance

6.2.13 Effective maintenance of the building elements is important to ensure ongoing compliance with the Building Code and is the responsibility of the building owner. The Ministry has discussed maintenance requirements in previous determinations (for example, Determination 2007/60).

6.2.14 I note the expert's recommendations outlined in paragraph 5.10.2 as to other measures he considers prudent. I note these areas do not affect my conclusions as to the compliance of the claddings, but suggest the owner consider these as part of the ongoing maintenance of the house.

6.3 The compliance of remaining items

6.3.1 The following addresses the remaining concerns identified by the authority in its refusal to issue a code compliance certificate for the house. The expert's report comments in detail on these concerns, and I have summarised his comments as part of Table 1 (see paragraph 5.8.1).

6.3.2 Taking account of the expert's report and the other evidence, I consider that the areas identified in paragraph 5.10.3 require repair in order to comply with Building Code Clauses D1 Access Routes, F4 Safety from falling, F7 Warning Systems and G13 Foul Water.

6.3.3 The expert's investigations also satisfy me that the remaining areas identified by the authority comply with Clauses B1 Structure and E3 Internal Moisture.

7. What happens next?

7.1 If the applicant wishes to pursue a code compliance certificate, a detailed proposal should be developed to address the areas identified in paragraph 5.10.1 and paragraph 5.10.3 of this determination. The proposal should be produced in conjunction with a suitably qualified person experienced in weathertightness repairs and I strongly suggest further invasive moisture testing be carried out. The proposal can then be submitted to the authority for its consideration and approval. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

8. The decision

8.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the building work does not comply with the building consent in a number of respects, and some building elements do not comply with the Building Code as follows:

- external claddings do not comply with Clauses E2 and B2
- the west wing stairs do not comply with Clauses D1 and F4
- deck balustrades, bathroom window and glass strip to pool do not comply with Clause F4
- smoke alarms do not comply with Building Code F7
- a kitchen waste pipe does not comply with Building Code Clause G13.

Accordingly, I confirm 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 3 June 2016.

John Gardiner
Manager Determinations and Assurance