



Determination 2015/019

Regarding the refusal to issue a code compliance certificate for a 13-year-old house with masonry veneer at 1178D Cove Road, Langs Beach, Waipu



1. The matters to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004¹ (“the current Act”) made under due authorisation by me, John Gardiner, Manager Determinations and Assurance, Ministry of Business, Innovation and Employment (“the Ministry”), for and on behalf of the Chief Executive of the Ministry.
- 1.2 The parties to the determination are:
- the owner of the house, M Norton (“the applicant”)
 - Whangarei District Council (“the authority”), carrying out its duties as a territorial authority or building consent authority.
- 1.3 This determination arises from the decision of the authority to refuse to issue a code compliance certificate for a 13-year-old house because it was not satisfied that the building work complied with certain clauses² of the Building Code (First Schedule, Building Regulations 1992).
- 1.4 The matter to be determined³ is therefore whether the authority was correct to refuse to issue a code compliance certificate. In deciding this, I must consider whether the items identified by the authority comply with the relevant clauses of the Building Code that was in force at the time the consent was issued; specifically Clauses B1 Structure, B2 Durability, E1 Surface water, E2 External Moisture and F2 Hazardous building materials.
- 1.5 I note that the building consent for this house was issued by a building certifier and the house was then constructed under the supervision of a second building certifier,

¹ The Building Act, Building Code, compliance documents, past determinations and guidance documents issued by the Ministry are all available at www.dbh.govt.nz or by contacting the Ministry 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.

³ Under sections 177(1)(b) and 177(2)(d) of the Act

followed by a multi-disciplinary consultancy. The certifiers and the engineering consultancy acted on the authority's behalf for approval of documentation and construction and will therefore be referred to within this determination as follows:

- the first and second building certifier “the authority’s certifying contractor”
- the multi-disciplinary consultancy “the authority’s engineering contractor”.

1.6 Matters outside this determination

1.6.1 I note that some items identified in the notice to fix issued in 2007 were subsequently resolved, and this determination is therefore limited to the remaining item and those subsequently added by the authority in its letter to the applicant dated 1 October 2014 (see paragraph 3.9.2).

1.6.2 The applicant also intends to apply to the authority for a modification of the requirements of Clause B2.3.1 to allow durability periods to commence from the date of substantial completion in 2001. I therefore leave this matter to the parties to resolve once the house has been made code-compliant.

1.7 In making my decision, I have considered:

- the authority’s submission
- the applicant’s submission, which included:
 - construction photographs
 - reports from an engineer engaged by the applicant
 - the reports from the architect for the house
- the report of the independent expert commissioned by the Ministry to advise on this dispute (“the expert”)
- the other evidence in this matter.

2. The building work

2.1 The building work consists of a two-storeys-high detached house situated on a level coastal site in a wind zone requiring specific design as described in NZS 3604⁴. The house is fairly complex in plan and form and is assessed as having a moderate to high weathertightness risk.

2.2 Construction is generally conventional light timber frame, with some specifically engineered elements. The house has concrete foundations and floor slab, plastered masonry veneer wall cladding, clay tile roofing and aluminium joinery.

2.3 Most walls are conventional 100mm concrete block masonry veneer, with a 40mm drainage cavity. Parapet end walls are 200mm thick reinforced concrete block, which are specifically engineered to be free-standing and are separated from the timber framing by a 40mm drainage cavity.

2.4 Roofs and parapets

2.4.1 The 20° pitched roofs have eaves of about 600mm overall and verges of about 300mm except at parapet walls. Exposed cedar rafter extensions and outriggers support exposed roof battens and roof tiles at roof overhangs, with the clay tile profile providing ventilation gaps into the cavity.

⁴ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

2.4.2 As outlined in paragraph 2.3, 200mm reinforced concrete block parapet walls rise above the timber framed roof to form parapet upstands with the wall cavity terminated at roof level. The exterior plaster continues over parapet capping blocks, with plaster to the top formed to fall 20mm towards the roof.

2.5 The decks

2.5.1 Two enclosed decks, with tiled floors and timber framed balustrades, open from the upper level master bedroom. The balustrade cladding is a monolithic cladding system described as stucco over a solid backing. In this instance it consists of 12mm plywood sheets fixed directly to the framing timbers, and covered by a slip layer of building wrap, metal-reinforced 20mm thick solid plaster and a flexible paint coating. (I note that the consent detail for the balustrade does not note any building wrap installed between the plywood sheets and the framing.)

2.5.2 Deck floor tiles are laid over a butyl rubber membrane which is turned up under the plaster. The plywood substrate is fixed to reclaimed 'turpentine pine' deck joists which the expert described as 'dense, hard and difficult to penetrate'. Solid packers fixed above the joists support the plywood substrate, with peeled manuka poles spanning between packers to provide a non-structural decorative soffit lining.

2.6 The expert reported that the wall and roof frames were untreated kiln dried radiata pine and noted that invoices indicate other framing was a mix of untreated and 'H3' treated pine. Three samples extracted from bottom plates were tested for preservative and boron was detected in one sample, with no treatment detected in the other two. Based on this evidence and the date of construction in 2001, I consider that external wall framing in the house is generally untreated.

3. Background

3.1 As outlined in paragraph 1.5, the building consent for this house was issued by a building certifier and the house was then constructed under the supervision of a second certifier, followed by a multi-disciplinary consultancy. The authority's certifying contractor approved the consent documents on 10 November 2000.

3.2 Construction of the house

3.2.1 The authority issued the building consent (No. 45786) on 13 November 2000 to the applicant under the Building Act 1991 ("the former Act"). A standard form ticked off seven 'inspections required as a condition of consent'.

3.2.2 The authority's certifying contractor inspected footings and pre-pour plumbing during December 2000 and the authority's engineering contractor carried out the remaining inspections, including:

- pre-pour foundations and floor slab on 10 January 2001 (which passed and noted vapour barrier, mesh, reinforcing and piles 'OK')
- foundations for posts on 14 April 2001 (which passed)
- stormwater drains, pipes and water tank on 22 May 2001 (which passed)
- pre-cladding and pre-line framing and bracing on 13 June 2001 (which passed)
- part height masonry veneer and chimney masonry on 31 July 2001 (which passed and noted reinforcing and washout 'OK')

- masonry and pre-line on 14 August 2001 (which passed and noted plumbing, moisture, insulation and parapet reinforcing 'OK')
- post-line bracing on 12 September 2001 (which passed)
- free standing masonry wall on 12 November 2001 (which passed).

3.2.3 I note that all inspections called for in the consent conditions were satisfactorily carried out except for the final inspection. The house was apparently completed in December 2001 without a code compliance certificate being issued. In 2007 the applicant realised that matters remained unresolved and approached the authority.

3.3 The 2007 notice to fix

3.3.1 The authority carried out a final inspection on 23 July 2007 and issued a notice to fix on 25 July 2007. The record of the final inspection 'Field Advice No.10174CC' identified 18 items to be attended to, and the notice to fix stated that the building work did not comply with the Building Code in regard to:

- Cedar rafters exposed to weather – structural members.
- Turpentine timber members – structural members exposed to weather and in some cases in ground.
- Plastered enclosed deck barriers with stucco top cover and vertical penetrations unsealed.
- No overflows to enclosed decks.
- Tea-tree as deck support.
- Further items as may be noted on Field Advice No.10174CC.

3.3.2 The notice to fix outlined the work required to remedy the areas of contravention or non-compliance as follows:

1. Provide durability statement on turpentine timbers.
2. Provide durability statement on tea-tree members.
3. Expose suspect areas of handrail and obtain a building consent for remedial work if required.
4. Install overflows to decks, or
5. Seek a determination....

3.4 The first refusal to issue a code compliance certificate

3.4.1 In a letter dated 18 December 2007, the applicant attached additional documentation and provided detailed comments from the architect on items identified during the final inspection. Items and responses are summarised in Table 1.

Table 1: Final inspection on 23 July 2007

| Final inspection record (No.10174CC) | | Architect's comments | Code Cl. |
|--------------------------------------|--|--|----------|
| No. | Authority's concerns | | |
| 1 | Some existing weep holes blocked | To be checked and cleaned out | B2,E2 |
| 2 | No weep holes to north and south walls | | |
| 3 | Lack of weep holes at top of veneer | Parapet walls: confirm/remedy At other walls, openings to cavity are below tiles at eaves | |
| 4 | Unsealed post/cladding junction | Reseal all timber/brick junctions, but not material if members not bridging cavity | |
| 5 | Veneer drainage above timber beams | Confirm and remedy if necessary | |
| 6 | Lack of as-built detailed drawings | As-built details provided | |
| 7 | Weather-tightness of parapet tops | Parapet tops are filled concrete blocks, with cavity protecting framing – refer detail | |

| Final inspection record (No.10174CC) | | Architect's comments | Code Cl. |
|--------------------------------------|---|--|----------|
| No. | Authority's concerns | | |
| 8 | Weathertightness of exposed roof tiles and beams at eaves overhangs | Junction sheltered under roof overhang. Any moisture will drain down veneer cavity | |
| 9 | Cracks to veneer plaster Report on structure/weathertightness | Plaster does not affect weathertightness Structural cracking to be investigated. | B1,E2 |
| 10 | Plastered top to deck balustrade, Cracks showing –expose framing | Balustrade framing H3.2 with treated ply Propose removing small section of cladding to inspect framing. Will replace plastered top with timber capping | |
| 11 | Exterior rafters not to NZS3602 | Exposed cedar rafters etc are stub members fixed into roof rafters – easily visible and can be replaced so only need 15-year min durability. | |
| 12 | Durability of exposed structural timbers | Manuka poles are not structural – span only between solid packing above rafters Exposed beams/columns are turpentine pine (species of eucalypt) used for wharf piles. | B1,B2 |
| 13 | Lack of gas certificate | | G11 |
| | Lack of electrical certificate | | G9 |
| 14 | Producer Statements | | |
| a | Roofing tiles and fixing | | B2,E2 |
| b | Butynol flashings to parapets | | |
| c | Waterproofing to decks | | |
| d | Waterproofing to interior tiling | | E1 |
| e | Solar hot water system | | G12 |
| f | Fireplace installation/ information | | C |
| 15 | Glass at window seats | To investigate and remedy if necessary | F2 |
| 16 | Lack of deck overflows | Overflows being currently installed | B2,E2 |
| 17 | Beam penetrations through veneer | Reseal all timber/brick junctions, but not material if members not bridging cavity | |
| 18 | Producer Statement for plaster/paint system | Veneer does not need to be watertight, so plaster and paint system is cosmetic only. | |

3.4.2 The authority responded on 21 January 2008 and did not accept most of the architect's comments; maintaining that only part of the construction was masonry veneer. The authority added that there also appeared to be no expansion joints installed or any sill flashings and concluded that the building work:

...[does] not comply with the Building Code in terms with Clause B1, B2 and E2 as set out above. Therefore we are unable to issue a Code Compliance Certificate.

3.4.3 Following further discussions between the parties, on 3 November 2008 the architect submitted details proposed for a timber capping and saddle flashing to the balustrade. The authority accepted a revised detail in a letter to the architect dated 14 November 2008; however, work was then delayed for some time.

3.5 When a contractual dispute about failure of the paint system was resolved, repair of minor plaster cracking using a flexible patching compound was carried out and the veneer was repainted in 2008. Some remedial work was also undertaken which included plaster repairs to the deck balustrade and changes to handrails, although the latter did not accord with the architect's revised details.

3.6 It appears that the authority had not seen or approved the alterations as I have seen no further correspondence between the parties until the applicant again sought a code compliance certificate in late 2013.

3.7 The second refusal to issue a code compliance certificate

- 3.7.1 The authority carried out a 'final recheck' inspection on 23 December 2013 and met with the applicant and builder on 23 January 2014, when additional information and statements were provided.
- 3.7.2 The authority wrote to the applicant on 24 January 2014, referring to the meeting, the earlier notice to fix, and the architect's response to the original final inspection record (see Table 1). In a letter to the authority dated 11 February 2014, the architect provided additional information, noted additional work being undertaken, and commented on the authority's remaining concerns as summarised in Table 2.

Table 2: Reinspection on 23 December 2013

| Letter of 24 January 2014 | | Architect's comments | Code Cl. |
|---------------------------|--|---|----------|
| No. | Authority's concerns | | |
| 1 | Posts have been cut and refixed above ground so Turpentine Pine is accepted | Noted | B2 |
| 2 | Gap to altered handrail too large | Mid-rail added to reduce gap to below 100mm | F4 |
| 3 | Veneer cavities to be vented but sealed off from roof space | Openings to cavity below tile profile at eaves Building paper seals off roof space from cavity | B2,E2 |
| 4 | Glass safety film to window seats not accepted if applied to outside of glass | Producer Statement provided for safety film | F2 |
| 5 | Blockwork stripped and replastered without structural report on cracking | Plaster does not affect weathertightness Engineer commissioned to report on blockwork. | B1 |
| 6 | Approved alterations to balustrades not carried out. No inspection of framing carried out | Current handrail fixing now side fixed Balustrade framing H3.2 with treated ply Applicant used endoscope to view framing. | B2,E2 |
| 7 | Outrigger cedar rafters support roof tiles so require 50 year durability | Installed in accordance with original approved consent drawings Durability statement provided indicating expected durability in excess of 25 years Maintained with regular oil-based preservative Lack of soffit linings allow timber to dry 140x90 members are oversized for cantilever s of 450mm maximum | B1,B2 |
| 8 | Now require third party report on code compliance, usually from building surveyor. | | |
| 9 | Receipt acknowledged of: Electrical certificate Solar hot water system Deck membrane Plumbing under pressure Clay roof tiles Bathroom tile waterproofing | | |
| | Still require Producer Statements for: Butynol flashings to parapets Fireplace installation/ information Plaster system Paint system Maintenance schedule for paint | | |

- 3.7.3 Because the original engineer for the house was not available the applicant commissioned a second structural engineer, who visually inspected the exterior of the house and reported to the authority on 20 March 2014. The engineer noted the repainting and plasterwork repair carried out in 2008 and stated that there was 'no evidence to suggest there is any structural problems with the house structure which supports the plastered brick veneer'. The engineer concluded:

In our opinion the issues with the first paint system are not structural and were due to an inadequate product being used in a demanding environment. The current paint

system has performed well for over five years and with normal maintenance will continue to perform for the expected life of the dwelling.

3.7.4 In a letter to the applicant dated 19 May 2014, the authority maintained its position on most items identified in previous correspondence despite the additional documentation provided. The authority identified the following items (in summary with item number from Table 2 provided in brackets):

- ventilation of top of veneer cavities (item 3)
- compliance of glass safety film depending on position on glass (item 4)
- solid reinforced blockwork implies structural blockwork and engineer's report does not adequately address concerns on cracking (item 5)
- the deck balustrade is plastered against the wall with no gap, so still needs a saddle flashing (item 6)
- the deck balustrade is also supported on timber framing so is still subject to movement and cracking (item 6)
- the information submitted on the durability of the exposed cedar rafters limits expected life to 30 years at the most, which is insufficient (item 7)
- potential for ponding given height of overflows above deck floor (new item).

3.7.5 The authority stated that it was therefore still unable to issue a code compliance certificate and suggested a determination be sought on the matter.

3.8 Engineer's updated report

3.8.1 In a letter dated 15 September 2014, the applicant asked the authority to review the situation; attaching further information and responses which included:

- further explanation and response from the architect
- the engineer's second report dated 21 August 2014
- emails from glass coating installer confirming installation on inside of glass
- photos before and after paint stripped, showing repaired cracks
- statement from plaster supplier on recommended repair to cracking
- construction photographs of deck balustrade
- proposed waterproofing of balustrade top and junction with wall
- an email from the Ministry with advice on durability of cedar rafters and current requirement for dummy rafters to be H1.2 radiata pine
- photographs of deck overflows showing height above deck floor.

3.8.2 Included in the applicant's request for review, was an updated report dated 21 August 2014 from the engineer in regard to the authority's concerns about past 'cracking of the plaster system over the block veneer on the exterior walls of the house.' The engineer explained that the previous report (see paragraph 3.7.3) had not been based on a full set of drawings, which had since been received.

3.8.3 Based on the documentation and construction photographs now available, the engineer was able to confirm the following about the construction (in summary):

- The chimney structure and some single-storey high ground floor walls are reinforced block masonry and there are no cracks in these elements.
- The reinforced masonry walls are designed to provide parapet walls that extend above roof level at the gable end walls of the house.
- The walls are free-standing and engineered to be self-supporting to allow them to be separate from the timber framed wall structure, with a cavity between.
- The house was fully constructed and plastered prior to the timber framed deck balustrade, which does not connect to the house wall structure.
- The issues with the first paint system were not structural and there is no evidence of problems with the replacement system after more than five years.

3.8.4 The engineer concluded:

We believe the construction method of a cavity separating the internal timber framed structural wall from either the standard block veneer cladding or the reinforced block masonry exterior wall is the most robust construction method in relation to weather tightness and ensures that if any water does infiltrate the outer skin it still drains away and does not affect the timber framed internal wall.

3.9 The third refusal to issue a code compliance certificate

3.9.1 The authority responded on 16 September 2014, stating that the property file had been reviewed with all information taken into account. The authority again refused to issue a code compliance certificate as it was 'unable to be satisfied on reasonable grounds' that the house 'as presented is compliant and will continue to be compliant with the performance requirements' of the Building Code.

3.9.2 In a following letter dated 1 October 2014, the authority stated that under section 95A of the current Act it was unable to issue a code compliance certificate and outlined reasons for its refusal, which included items not identified in prior refusals. The authority stated:

The following areas are where [the authority] cannot be 'satisfied on reasonable grounds' as to compliance:

1. Breach of Section 40 of the Building Act – all works carried out without a formal amendment to the building consent following agreement 'in principle' in 2008.
2. Construction details unknown as not inspected by [the authority]
 - all tiled roofing areas
 - all roof/wall junctions
 - all roofing penetrations and roof flashing systems
 - the concrete masonry veneer walls including structural ties to timber framing
 - the sealing off of veneer walls at the roof junctions – i.e. ventilation
 - the weatherproofing of all penetrations through the veneer walls
 - the waterproofing of the rebates at the base of the veneer walls
 - the durability of 'structural' roofing members exposed to weather and salt environment
 - the deck membranes overlaid with tiles (inaccessible for maintenance)
 - the fixing method at the framing line for the large structural timber members – pergola, decks etc.

- 3.10 The applicant received no response from the authority to subsequent emails and concluded that the authority was adding further conditions to pressure him into seeking a determination. Deciding that further discussions with the authority would fail to resolve matters, the applicant sought a determination and the Ministry accepted the application on 5 November 2014.

4. The submissions

- 4.1 The applicant outlined the background to the situation, noting that he had not realised that any matters were outstanding when the house was completed. When he had realised that the owner was responsible for seeking a code compliance certificate, he was 'going through a litigation process with the paint manufacturer'. Specialist advice from a 'paint chemist' supported the plasterer's recommendation on repair of the 'minor cracking' associated with the paint failure. The applicant described his endeavours to resolve the situation until he had come to the realisation that the authority 'were adding further conditions and pushing me harder into applying for the determination.'
- 4.2 The applicant forwarded copies of:
- the drawings and specification
 - the list of required inspections and the inspection records
 - the authority's final inspection record dated 23 July 2007
 - the notice to fix dated 21 December 2007
 - correspondence with the authority
 - the architect's responses to the authority's correspondence
 - the engineer's reports dated 20 March 2014 and 21 August 2014
 - construction photos taken during 2001
 - photos of the plaster repairs and repainting during 2008
 - various certificates, producer statements, photographs and other information.
- 4.3 The authority forwarded a copy of its property file for the house, which contained some additional documents pertinent to this determination including:
- the building consent, with the consent drawings and specifications
 - the amended engineering drawings, received on 10 November 2000
 - the review sheet dated 10 July 2007, summarising the inspections
 - various certificates, producer statements, photographs and other information.
- 4.4 Copies of the submissions and other evidence were provided to each of the parties.
- 4.5 A draft determination was issued to the parties for comment on 16 March 2015.
- 4.6 The authority and the applicant accepted the draft without further comment in responses received on 24 and 25 March 2015 respectively.

5. The expert's report

5.1 As mentioned in paragraph 1.7, I engaged an independent expert to assist me. The expert is a member of the New Zealand Institute of Architects and inspected the house on 10 December 2014 and provided a report dated 16 January 2015, a copy of which was forwarded to the parties on the same day.

5.2 General

5.2.1 The scope of the investigation was to report on the remaining unresolved items identified by the authority with regard to compliance with clauses B1, B2, E1, E2 and F2 of Building Code. In particular, the following were investigated:

- exposed cedar rafter extensions and outriggers
- deck and pergola posts
- plastered deck balustrades
- deck overflows
- glass to window seat areas
- hidden areas not inspected by the authority during construction.

5.2.2 The expert observed the following variations from the consent drawings:

- timber cappings to deck balustrades replaced with plastered tops
- work to deck balustrades carried out since 2001 without formal consent.

5.3 Exposed cedar roof members (Clauses B1 and B2)

5.3.1 The expert noted that the authority's concerns relate to the rafter extensions at the eaves and outriggers at verges. These timber members provide support to the tiles and the tile battens, so they do perform a minor structural function.

5.3.2 The expert considered the exposure of these members and noted that verge outriggers are sheltered from rain by bargeboards so would be considered to be in a 'sheltered' zone⁵. Eaves extensions are also sheltered, apart from a small triangle at the exposed ends. The expert inspected eaves extensions above the garage and could see no visible deterioration.

5.3.3 The applicant removed three clay tiles at the garage eaves to allow inspection of the underlying construction. The expert cut a timber sample from the top surface of an eave extension and forwarded it for analysis. The laboratory report dated 17 December 2014 noted that the sample was untreated and tests detected no 'established decay morphology and no incipient brown rot'. However, there was 'moderately dense fungal growths' which were 'concentrated within outer layers'.

5.3.4 The expert noted the following:

- The sample is subject to moisture during high humidity, via diffusion from porous clay tiles when wet and from rain spray during heavy windblown rain.
- The sample was taken from the uncoated top surface of the extension and it is likely that other visible surfaces of the cedar will contain fewer fungal growths as these surfaces are coated with clear 'penetrating oil preservative'.

⁵ In accordance with NZS 3604 Figure 4.3(a)

- Given the absence of decay after 13 years, the laboratory scientist considered that the timber could be expected to perform adequately for a further 37 years assuming that conditions remain the same.

5.3.5 Taking account of the particular circumstances, the expert concluded that the rafter extensions and the verge outriggers are adequately durable for their structural function in this house.

5.3.6 I also note that the 140mm x 90mm timbers are sized with a significant reserve in their structural capacity to support the roof overhang.

5.4 Exposed structural timber posts (Clauses B1 and B2)

5.4.1 The expert noted that the deck and pergola posts had been originally cast into concrete but had been modified following the notice to fix in order to lift the base of the posts above ground.

5.4.2 The expert noted that posts are now supported about 70mm above concrete paving, with proprietary stainless steel post brackets and bolted connections. The expert considered that the posts now comply with Clause B2.

5.5 Deck balustrades (Clauses E2 and B2)

5.5.1 The expert took invasive moisture readings through the cladding at balustrade/wall junctions and recorded 15% and 16% at the northwest deck. (I note readings were taken during summer and moisture levels may be higher during wetter winter months.)

5.5.2 At the northeast deck, the expert recorded:

- 18% in the top plate to the northwest junction
- 35%, with soft drillings in the top plate to the southeast junction.

5.5.3 The expert noted the following:

- The crack at the balustrade/wall junction would have allowed moisture to penetrate the junction and enter balustrade framing, but it is unlikely that any moisture could reach the house framing, given the continuous masonry veneer and the cavity behind the junction.
- The low invasive moisture reading of 13% at the bottom of the stud to the timber-framed wall behind a junction supports the protection of the wall framing by the veneer and cavity.
- The balustrade framing is reported to be H3.2 treated but that has not been verified. Notwithstanding any treatment, drillings were soft and steel fixings may be rusting from water penetration over time. (I also note that other areas of the balustrade framing may have been subject to leaks prior to 2008 repairs.)
- The applicant's proposal to apply a membrane over the existing cladding does not allow any drainage and dissipation, and also does nothing about any existing damage of the balustrade framing.

5.5.4 The expert concluded that the existing deck balustrades are not adequately weathertight and durable.

5.6 Deck overflows (Clause E1)

- 5.6.1 The expert observed that deck overflows had been installed to both decks. The expert measured the height above the deck floors and noted that this was about 60mm. This is below door threshold level, which is about 120mm above the deck floor.
- 5.6.2 The expert considered that the provision for overflow to each deck appeared adequate in these circumstances. I note that the overflows should allow any deck drain blockage to be attended to without undue damage.

5.7 Glazing film to window seat glass (Clause F2)

- 5.7.1 The expert noted that the windows above the window seats to the ground floor family room are approximately 300mm above the level of the seats. The glass was 5mm and was identified in the final inspection; presumably as a contravention of Clause F2. The Acceptable Solution⁶ to this clause states that windows above window seats with glass areas less than 1.2m² shall be annealed glass.
- 5.7.2 The applicant has applied a safety film to the windows, and the producer statement from the film manufacturer dated 20 May 2009 states that the film applied to 4mm glass complies with Grade A impact requirements of AS/NZS2298⁷ and this has been tested by BRANZ. Providing copies of the test records are available, the evidence would demonstrate compliance with the requirements of Clause F2.

Construction details not inspected by the authority

- 5.8 The expert also commented on other areas identified in the authority's refusal to issue a code compliance certificate. The authority considered these to be unknown details because the underlying construction was not inspected during construction. The following paragraphs outline the expert's findings on those areas.

5.9 The roofs (Clauses E2 and B2)

- 5.9.1 The authority had stated that it could not be satisfied with the adequacy of concealed roof components as it had not inspected the tiled roof areas, the roof/wall junctions and the roof penetrations and flashings during construction. The expert inspected the visible elements of the roofs and the following outlines his findings.
- 5.9.2 The expert inspected the tiles and commented as follows:
- The European barrel roof tiles are in good condition, with no visible signs of 'spalling, cracks, frost damage or other signs of premature deterioration'. Lichen growth on some tiles is to be expected after 13 years in service and may be removed by chemical washing.
 - Tiles are fixed with 50mm stainless steel ringshank nails and washers, and are uniformly set out in straight courses, with no sign of tile displacement, sagging, cracked pointing or evidence of inadequate fixing or support.
- 5.9.3 The expert commented on roof/wall junctions as follows:
- Parapet junctions appear to accord with the consent detail that shows a butyl rubber gutter flashing at the junction.

⁶ Acceptable Solution F2/AS1 Table 3 D4

⁷ AS/NZS2298:1996: Safety Glazing – Human Impact Considerations

- Construction photos in October 2001 show a membrane upstand taken up the plywood substrate of the clad deck balustrade, providing supporting evidence that hidden junction flashings accord with the consent details.

(I also note that pre and post-plastering construction photos in September 2001 show membrane upstands against concrete block, later covered over by plaster.)

5.9.4 In regard to roof penetrations and flashings, the expert commented as follows:

- Vent pipes are fitted with proprietary flexible collars, with lead flashings dressed under the upper tiles and over the lower tiles – and appear to have been competently installed, with no evidence of associated roof leaks.
- The solar panels are installed within an untiled ‘bay’ in accordance with the detail drawings. The surrounding membrane and the adjacent tiles are in good condition, with the underlying soffit and ceiling free from signs of leaks.

5.9.5 The expert concluded that the above provides evidence that the roofs, including junctions, penetrations and flashings have performed satisfactorily for more than 13 years and are likely to comply with performance requirements of Clauses E2 and B2.

5.10 Concrete masonry veneer walls (Clauses B1, E2 and B2)

5.10.1 The authority had stated that it could not be satisfied with the adequacy of concealed wall components as it had not inspected the masonry veneer walls, the top of the veneer cavities, waterproofing of wall penetrations and slab rebates during construction. I note that inspections during construction of these elements were undertaken by the authority’s engineering contractor as outlined in paragraph 3.2.2.

5.10.2 The expert commented on the veneer ties as follows:

- The inspections carried out by the authority’s engineering contractor included satisfactory part-height masonry on 31 July 2001, and any lack of ties would have been identified during that inspection and noted in the record.
- Removal of a section of wood store ply lining and building wrap allowed inspection of about 1m² of cavity by using a torch and mirror. Seven ties could be seen, with the closest tie appearing to be correctly installed.
- The block layer’s invoice included an item for fixing more than 1100 ties and there are no signs of distress in the walls after more than 13 years.

5.10.3 In regard to ventilation at the top of cavities, the expert commented as follows:

- The consent detail shows the roof underlay wrapped over solid blocking and overlapping the building wrap to the wall framing. When tiles were removed from garage eaves, the bottom of the roof underlay could be seen.

(I also note that construction photos in July 2001 show roofing underlay overlapping the building wrap at the gable end walls, providing supporting evidence that cavities accord with the consent detail.)

- The space open to the top of the cavity is around tile battens above the underlay, with upper skillion ceilings free from mildew and other signs of high moisture levels in the ceiling, indicating that cavity ventilation is adequate.
- However, roofing underlay also discharges any roof condensation or leaks into wall cavities, which may lead to other risks as outlined in paragraph 5.11.3.

5.10.4 In regard to penetrations through veneer walls, the expert commented as follows:

- The block veneer is penetrated by heavy structural timber beams that support decks, pergolas and the entrance canopy, some of which bridge the cavity.
- When inspected, members were well sealed to the veneer with a flexible sealant, so moisture levels were not tested due to the absorptive nature of masonry and the cavity protecting against transfer of moisture to framing.
- However later examination of photos showed some splits in the reclaimed timber and records revealed that sealant had been applied some time after completion; leading to a possibility of moisture transfer in the past.
- Although it is unlikely that beam penetrations have lead to a failure of weathertightness and durability, it would be prudent to carry out moisture testing of internal framing close to beam connections to confirm adequacy.

5.10.5 In regards to waterproofing of slab rebates, the expert commented that the door threshold plate to the gas store was removed and the underlying slab rebate appeared to accord with the consent detail. (I also note the authority's engineering contractor carried out pre-cladding and pre-line inspections on 13 June 2001, during which slab rebates would have been visible and any defect should have been identified and noted in the record.)

5.11 The bottom plates (Clauses E2 and B2)

5.11.1 While investigating the slab rebates, the expert noted signs of moisture in the wood store and carried out sample invasive moisture testing of bottom plates to the gas and wood stores, recording moisture levels of 18%. To investigate timber condition, the expert took three timber samples for analysis, including one from the garage bottom plate. The laboratory report dated 17 December 2014 reported that:

- Sample 1: wood store bottom plate – likely to have been H1.2 boron treated
Advanced decay with replacement likely to be required.
- Sample 2: gas store bottom plate – likely to have been untreated
Earlier stages of decay and replacement may be required.
- Sample 4: garage bottom plate – likely to have been untreated
Fungal growths but no structurally significant decay.

5.11.2 In the case of the severe decay to the wood store bottom plate, the expert considered that one of the primary causes 'was almost certainly its use for storage of sometimes wet and decaying fire wood.' However, that use did not apply to the gas store or to the garage, and evidence of moisture penetration was also apparent in those samples.

5.11.3 The expert therefore considered that further investigation of the cause(s) was needed as damage could have resulted of from one or a combination of:

- insufficient weatherproofing of the timber doors and door frames to the stores
- the lack of head flashings above the timber doors
- a possible lack of weep holes at the base of veneer walls to the stores
- other possible defects in the cavity, such as:
 - water from the roof underlay tracking down the building wrap
 - mortar droppings at the base of the cavity etc.

5.11.4 In view of the fungal growth found in the garage bottom plate and the lack of treatment detected, the expert also considered that the condition of the ground floor bottom plates generally should be further investigated.

5.12 The deck membranes (Clauses E2 and B2)

5.12.1 The authority had stated that it could not be satisfied with the adequacy of the underlying deck membrane as it had not inspected substrates prior to tile installation and the membrane is also not accessible for maintenance.

5.12.2 The expert inspected visible elements of the deck floors and commented as follows:

- The deck tiling generally appears ‘sound, free from cracks, loose bedding etc., although there was evidence of past leaking from the northwest deck in the form of water stains to the manuka pole soffit below the deck outlet.
- The deck joists are Turpentine pine reclaimed from wharf piles, and the authority agrees that it is adequately durable for use externally uncoated. The wood is ‘dense, hard, difficult to penetrate with a moisture meter even in areas where wetted’.
- Due to the durability of the deck framing, it is reasonable to assume that any leaks will not lead to the likelihood of decay and durability concerns.

(I also note that the decks are open beneath, and any moisture will readily dissipate.)

5.13 Fixings of large structural timber members (Clauses B1 and B2)

5.13.1 The authority had stated that it could not be satisfied with the adequacy of structural fixings as it had not inspected the framing and connections prior to veneer construction and lining installation. The expert commented as follows:

- Although the fixings could not now be inspected, a construction photo showed stainless steel brackets to a large beam and copies of invoices show the purchase of brackets.
- Given the above, together with the lack of plaster cracks around beam penetrations or any sign of structural movement, it is reasonable to conclude that the connections have performed for the past 13 years and are likely to continue to perform adequately.

(I note the authority’s engineering contractor carried out a part-height masonry inspection on 31 July 2001 when fixings would have been visible. Construction photographs taken during July indicate that the large timber members were in place before 21 July and may also have been in place during the pre-line inspection on 13 June 2001 as that record notes the rafter/post connections.)

5.14 The expert’s conclusions

5.14.1 Based on his investigations, the expert concluded that the following items identified by the authority complied with performance requirements of the Building Code (with clauses shown in brackets):

- exposed cedar rafter extensions and outriggers (B1 and B2)
- exposed structural timber posts altered without consent (B1 and B2)
- deck overflows installed without consent (E1)

- glazing film to window seat glass⁸ (F2)
- the roof in regard to tiles, roof/wall junctions, penetrations and flashings (E2 and B2)
- the masonry veneer walls in regard to veneer tiles, top ventilation of cavities, penetrations and waterproofing of slab rebates (E2 and B2)
- the deck membrane (E2 and B2)
- fixings of large structural timber members (B1 and B2).

5.14.2 However, the expert considered that the following items needed further investigation and remedial work as required in order to comply with Building Code Clauses E2 and B2:

- the deck balustrades, including the balustrade framing (see paragraph 5.5.3)
- the decayed timber in the gas store and wood store (see paragraph 5.11.3)
- the condition of ground floor bottom plates generally (see paragraph 5.11.4).

6. Compliance of items identified by the authority

6.1 Clauses E2 and B2: Weathertightness

6.1.1 Taking account of the expert's report, the external envelope generally appears to have been constructed in accordance with good trade practice and the manufacturer's instructions at the time of construction. However, there are some areas that require further investigation and/or remedial work as outlined in paragraph 5.14.2. Taking account of the expert's report, I conclude that the following areas require attention:

- the lack of weathertightness of the deck balustrades, including investigation and likely repair of the underlying framing
- the moisture penetration and damage to the gas and wood store framing
- additional investigation to:
 - identify and repair the cause(s) of the leaks that resulted in decay to framing in the gas store and wood store
 - establish the condition of the untreated bottom plates to the ground floor generally by invasive measuring of moisture levels and testing samples where moisture levels are high or there are other signs of damage.

6.1.2 I consider the expert's report establishes that the current performance of the cladding is not adequate because there is evidence of past and current moisture penetration and damage to the untreated timber framing. I am therefore not satisfied that the external building envelope complies with Clause E2 of the Building Code.

6.1.3 In addition, the building envelope is also required to comply with the durability requirements of Clause B2, which requires that a building continues to satisfy all the objectives of the Building Code throughout its effective life. The cladding systems are required to satisfy Clause E2 for a minimum of 15 years; however the expected life of the framing is a minimum of 50 years. Because the cladding faults would allow the ingress of moisture, the building work does not comply with the durability requirements of Clause B2.

⁸ Subject to the provision of a copy of the BRANZ test report

6.1.4 Because the identified cladding faults occur in discrete areas, I am able to conclude that satisfactory investigation and rectification of the items outlined in paragraph 6.1.1 will result in the external envelope being brought into compliance with Clauses B2 and E2 of the Building Code.

6.1.5 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 Ministry 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).

6.2 The remaining Building Code clauses

6.2.1 Taking account of the expert's report, the construction photographs and the other evidence, I am satisfied that the other items identified by the authority comply with Clauses B1, B2, E1 and F2 of the Building Code.

6.3 Conclusion

6.3.1 Taking account of the expert's report, I am satisfied that the house does not comply with the Building Code that was current at the time the building consent was issued and that the authority made an appropriate decision to issue the notice to fix in 2007. However, most items in that notice have since been resolved and I am of the view that other items identified in that notice are compliant. I have however identified additional items and investigations that need to be attended to, and the notice should be modified accordingly (refer to paragraph 7.1).

6.3.2 Paragraph 6.1.1 identifies some items that require further investigation and remedial work to bring them into compliance with the Building Code. I also identify some areas where there is currently insufficient information to form a view on reasonable grounds as to compliance. As some elements of the building work do not comply with the weathertightness and durability provisions of the Building Code in effect when the consent was issued I am therefore satisfied that the authority made an appropriate decision to refuse to issue the code compliance certificate in October 2014.

7. What happens next?

7.1 The notice to fix should be modified to take into account the findings of this determination, identifying the investigations and items listed in paragraph 6.1.1 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 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.

7.2 I suggest that the parties adopt the following process to meet the requirements of paragraph 7.1. Initially, the authority should revise and reissue the notice to fix. The applicant 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 person with suitable experience in weathertightness remediation, as to the investigation and 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.

8. The decision

- 8.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the exterior building envelope does not comply with Clauses E2 and Clause B2 of the Building Code that was current at the time the consent was issued and 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 5 May 2015.

John Gardiner
Manager Determinations and Assurance