



Determination 2015/045

Regarding the refusal to issue a code compliance certificate for a 12-year-old addition with monolithic and brick veneer claddings at 57 Blockhouse Bay Road, Avondale, Auckland



1. The matter 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

1.2.1 The parties to the determination are:

- the owners of the building, C and S Prasad (“the applicants”), acting through the builder as their agent
- Auckland Council (“the authority”), carrying out its duties as a territorial authority or building consent authority.

1.2.2 Although not licensed at the time the addition was constructed, the builder is currently a licensed building practitioner. The builder has assisted the applicants in seeking this determination and I consider the builder is a person with an interest in this determination.

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.

- 1.3 This determination arises from the decision of the authority to refuse to issue a code compliance certificate for a 12-year-old residential addition to an existing shop (“the addition”) because it was not satisfied that the building work complied with certain clauses² of the Building Code (First Schedule, Building Regulations 1992). The authority’s concerns about the compliance of the building work relate primarily to the weathertightness and durability of the exterior cladding.
- 1.4 The matter to be determined³ is therefore whether the authority was correct to refuse to issue the code compliance certificate for the reasons given in its letter dated 20 June 2014. In deciding this matter, I must consider whether the external building envelope of the addition complies with Clause B1 Structure, Clause B2 Durability and Clause E2 External moisture of the Building Code that was in force at the time the consent was issued. The building envelope includes the components of the systems (such as the wall claddings, the windows, the decks and the roof claddings) as well as the way the components have been installed and work together. I consider this in paragraph 6.
- 1.5 Matters outside this determination**
- 1.5.1 When refusing to issue a code compliance certificate for the addition, the authority referred to the effect on structural bracing of what the authority stated was unauthorised wall cladding changes. As outlined in paragraph 3.1.3, these changes were approved under an amendment to the building consent; therefore the bracing is not considered further in this determination.
- 1.5.2 The authority also referred to items outstanding from a historical notice to rectify⁴ dated 2 February 2005 that included non-compliance with Clause B1 Structure. Apart from the wall cladding change described above, no other items in that notice directly relate to structural matters. I have taken the view that structural concerns are limited to any possible consequential structural damage to the timber framing as a result of moisture penetration through the external envelope. Clause B1 is therefore considered as part of the matter described in paragraph 1.4 above.
- 1.5.3 The notice to rectify also referred to non-compliance with Clauses E3, G4 and H1 of the Building Code, although the attached ‘evidence’ to the notice includes no items relating to those clauses. When refusing to issue the code compliance certificate, the authority limited its remaining ‘areas of concern’ to items associated with the clauses outlined in paragraph 1.4 and this determination therefore does not address other clauses of the Building Code.
- 1.5.4 Prior to construction of the subject building work, the site accommodated a shop with an adjacent dwelling. That dwelling was demolished under a separate building consent (No. AC/02/04902) issued on 11 July 2002 and is not considered further.
- 1.5.5 I also note that the owner may apply 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 2003. Although I leave this to the parties to resolve in due course, I comment on this further in paragraph 7.
- 1.6 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 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

⁴ The equivalent of a notice to fix under the current Act

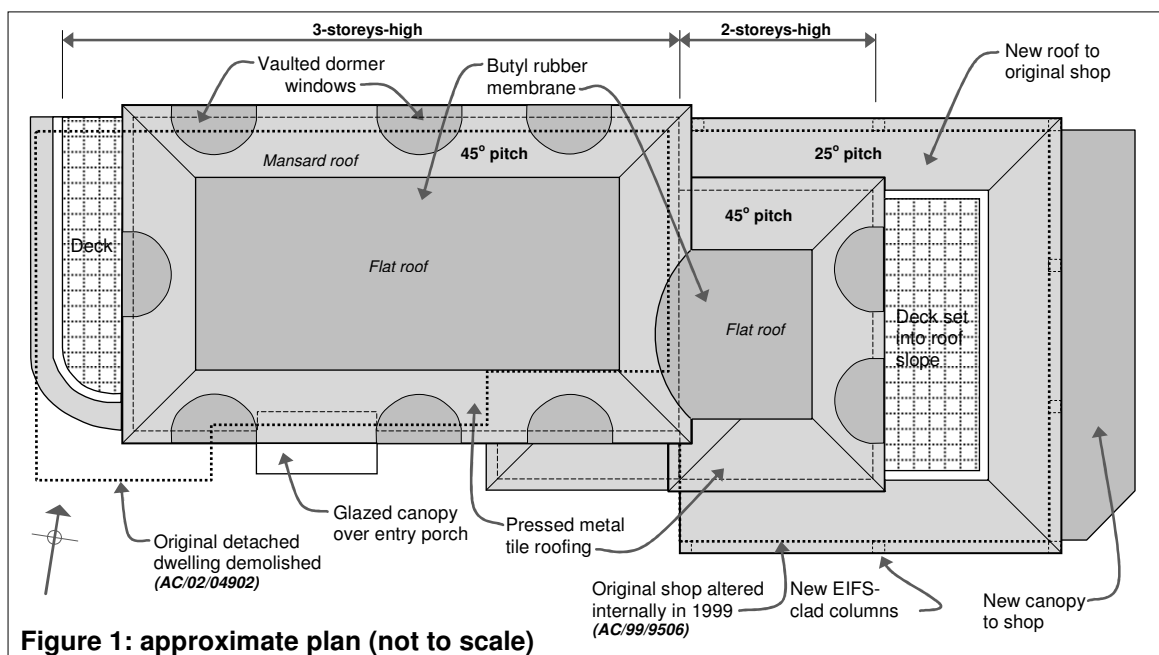
2. The building work

2.1 The original buildings

- 2.1.1 The corner site originally accommodated a timber-framed detached house built in 1950. In 1953 a detached concrete block retail building was constructed adjacent to the east wall of the house. Various internal alterations were made to the shops and in 1999 the remaining internal wall was removed and the building became one outlet.
- 2.1.2 The original detached house behind the shop was demolished under a separate building consent issued in July 2002, prior to construction of the house considered in this determination.

2.2 The house addition

- 2.2.1 The subject building work consists of a large house addition to the existing shop, with the house extending over part of the re-roofed shop as shown in Figure 1.



- 2.2.2 The completed building is a six-bedroom house which is three storeys high in part with an attached single-storey shop. The corner site is in a low wind zone as described in NZS 3604⁵, with the shop front facing Blockhouse Bay Road to the east and the garage doors and house entry facing the side street to the south. The house is complex in form and is assessed as having a very high weathertightness risk.

- 2.2.3 The three levels provide the following:

- Level 1: garage, games room, one bedroom, bathroom and laundry. Stairs lead up to the first floor and a lounge area has direct access into the shop.
- Level 2: main entry, kitchen, dining and living areas and a bedroom with ensuite bathroom. The bedroom opens onto a tiled deck to the west, while the lounge and adjacent deck extends to the east over the shop.
- Level 3: four bedrooms and two bathrooms, with the west bedroom opening onto a tiled deck to the west.

⁵ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

- 2.2.4 The original shop walls remain, with structural steel posts installed outside of the walls to support a new roof structure and the lounge above. The posts are framed and monolithic-clad, with plaster extended over columns and the original concrete block walls.
- 2.2.5 Construction is a mix of a specifically engineered structure and conventional light timber frame, with concrete foundations and floor slabs. Ground floor walls are 200mm thick concrete masonry with brick veneer installed over a cavity while upper floors are timber-framed with EIFS⁶ wall cladding. Windows and doors are aluminium, except for glass block panels to the north stairwell wall.
- 2.2.6 The expert forwarded moisture-damaged samples of framing timber for laboratory testing, which detected no preservative in two of the samples and limited boron⁷ in the third. Given the date of framing installation in 2002 and early 2003, I consider that the external framing is unlikely to be treated to a level that will provide resistance to fungal decay. I note the builder has described some areas of damaged framing as having later been replaced with treated timber (refer paragraph 5.13.1).

2.3 The roofs

- 2.3.1 Roofs consist of low-pitched butyl rubber membrane to central areas, with pressed metal tiles forming a 45° pitch mansard roof to the perimeter of upper floors. The new mansard roof above the original shop is 25° pitched metal tiles, with a low-pitched membrane canopy cantilevered above the footpath at the shop entrance.
- 2.3.2 On all elevations, aluminium window and door panels form bays to Levels 2 and 3, with wing walls that extend up to the soffits. On the south elevation, the glazed panel and timber framed wing walls continue down to form a bay window to the Level 1 games room.
- 2.3.3 On the upper roof, the windows and surrounds continue through the eaves to form arch-topped dormer windows with ‘barrel vault’ membrane roofs at the perimeter of the mansard roof. The EIFS-clad ends of the wing walls frame the glazed panels and extend as arched parapets around the dormer windows.

2.4 The decks

- 2.4.1 The house includes three decks and an entry porch. Each deck floor has tiles installed over butyl rubber membrane and timber framing, with monolithic-clad balustrades and side-fixed metal handrails.
- Deck 1 extends to the east from the Level 2 lounge area. The deck floor is set within the new roof to the shop below, with monolithic cladding to the deck side and top of the balustrades and a side-fixed metal handrail.
 - Deck 2 from the Level 2 west bedroom sits partly above the Level 1 garage.
 - Deck 3 from the Level 3 west bedroom sits above Deck 2 and is supported on clad circular columns.
- 2.4.2 On the south elevation, a pre-fabricated exterior staircase leads up to the Level 2 entry porch, which is recessed above the lower games room. The porch floor has tiles installed over butyl rubber membrane and timber framing, with open metal balustrades to match the stair balustrades.

⁶ Exterior Insulation and Finish System

⁷ Likely to have been treated to Hazard Class 1 of MP3640:1992 where primary risk was defined as insect attack.

2.5 The claddings

- 2.5.1 The wall cladding to the upper levels is a form of monolithic cladding system known as EIFS. In this instance, the system consists of 40mm polystyrene backing sheets fixed directly to the framing over the building wrap and finished with a proprietary mesh-reinforced plaster system. Although the particular product could not be verified, proprietary plaster systems in common use at the time of construction included purpose-made flashings to windows, edges and other junctions.
- 2.5.2 I have seen no evidence of producer statements or warranties for the cladding and there is no evidence of the EIFS system having been supplied by a single recognised proprietary installer. I note that the amendment consent and the notice to rectify refer to different cladding systems; with the cladding system in the notice being a light-weight mesh reinforced plaster system that can be applied over a variety of substrates.
- 2.5.3 The concrete block exterior walls to Level 1 are clad in brick veneer over a 40mm drained cavity. At the junction with the upper cladding, the EIFS appears to line up with the cavity, with a flat metal capping over the top of the brick and a metal flashing from the bottom of the EIFS to the top of the capping.

3. Background

3.1 Construction

- 3.1.1 The original consent drawings were prepared in February 2002 and called for the wall cladding to be a proprietary flush-finished fibre-cement monolithic cladding system. The authority issued building consent AC/02/01224 on 26 March 2002 under the Building Act 1991 (“the former Act”) for ‘New three storey dwelling attached to existing shops & demolish existing house’
- 3.1.2 The authority issued a further consent, AC/02/04902 on 11 July 2002 for ‘Demolish dwelling’. The original house was demolished in about July 2002 and construction commenced on new building work; with foundations and concrete block walls completed by September. The authority’s inspections during construction included:
- preline building and plumbing inspections from October to December 2002
 - postline inspections from December 2002 to January 2003.
- 3.1.3 In December 2002, the builder lodged an application for an amendment to the consent to cover the following work:
- Amend existing AC/02/1224 bracing and move bathroom
 - Insulclad cladding L2 and L3 to replace Harditex
- The authority issued consent no. AC/02/09152 on 11 December 2002 (“the amendment consent”) in response to the application.
- 3.1.4 The last recorded inspection was a drainage inspection in March 2003, so the house was likely to have been substantially completed in about mid-2003 although the final inspection was not carried out until 2004. The inspection record dated 30 July 2004 identified 10 outstanding items, including the following items related to claddings:
- no diverter flashing to end of apron flashing
 - end of gutter buried into plaster
 - membrane roofing ‘dropping’ into gutter

- insufficient overlap of flashing to top of brick veneer
- no spreaders to downpipes discharging onto lower roofs
- cladding changed to EIFS.

3.2 The 2005 notice to rectify

3.2.1 Following a ‘cladding inspection’ on 26 January 2005, the authority issued a notice to rectify (No.2093) dated 2 February 2005, which stated:

A site inspection of the above property carried out on 26 January 2005 revealed a number of areas where [the authority] has been unable to satisfy itself that it complies with the Building Code.

3.2.2 The notice to rectify identified a number of Building Code clauses that the building work contravened (see paragraph 1.5) and attached a list of ‘evidence’ and a ‘photo file’ of defects identified during the inspection.

3.2.3 The notice listed weathertightness concerns identified during the inspection and shown in the photos, which included (in summary):

- clearances from:
 - bottom of EIFS to paving
 - bottom of brick veneer to paving
 - finished floor level to exterior paving
- flashings in regard to:
 - balustrade/wall junctions
 - balustrade/column junctions
 - flat plastered balustrade tops
 - inter-cladding junctions
- unsealed penetrations through the EIFS
- unsealed fibre-cement soffits
- window sills
- plaster not taken up behind barge and fascia boards
- rainwater drainage in regard to:
 - lack of spreaders to downpipes above lower roofs
 - gutters butting against unfinished cladding.

3.3 Continuing inspections

3.3.1 The authority carried out a ‘recheck final’ inspection on 1 May 2006 which noted that ‘the requirements of N.T.R 2093 have not been met’. In a letter dated 8 June 2006, the authority noted the lack of progress and urged the applicants to ‘fix your home as a matter of urgency’ due to the risk of structural damage, stating:

The NTR was issued more than 6 months ago. Therefore the issues identified in the NTR may no longer be of concern to [the authority], and by the same token new issues may have arisen. Therefore it is necessary for [the authority] to undertake another inspection to determine the current areas where [the authority] cannot be satisfied on reasonable grounds that the work complies with the Building Code.

- 3.3.2 The builder carried out various repairs and the authority carried out a further inspection on 29 June 2006. The authority wrote to the applicants on 10 July 2006 stating that it was now 'reasonably satisfied that most items' in the NTR had 'now been adequately attended to'. However, the authority remained concerned about the lack of provision for drainage from the EIFS and the danger of timber damage resulting from undetected moisture penetration.
- 3.3.3 The authority continued to contact the builder during 2007, with the authority's records including a file note dated 21 September 2007 regarding a telephone conversation.
- 3.3.4 I have seen no record of further inspections or correspondence until a code compliance certificate was sought in 2014 and an inspection was undertaken on 20 June 2014. That inspection identified weathertightness defects and signs of moisture penetration.

3.4 The 2014 refusal to issue a code compliance certificate

- 3.4.1 In a letter to the applicants dated 20 June 2014, the authority gave notice under section 95A of the current Act that a code compliance certificate would not be issued because, based on an inspection on 4 June 2014 and a subsequent 'peer review' process, the authority could not be satisfied on reasonable grounds that the work complies with the Building Code or that 'it is performing as intended.'
- 3.4.2 The authority outlined its areas of concern as follows (in summary, with NTR item numbers shown in brackets):
- items remaining from the 2005 NTR (item 1 – see paragraph 3.2.1)
 - in regard to the shop canopy:
 - changed from profiled metal to membrane (item 2)
 - shop sign fixings penetrate membrane (item 2)
 - ponding due to lack of fall (item 3)
 - in regard to the decks:
 - down pipe discharging onto deck (item 4)
 - direct fixed tiles over membrane, with cracks to mortar (item 5)
 - plants on west deck allow moisture and dirt (item 6)
 - lack of balustrade/wall saddle flashings (item 9)
 - downpipes penetrate decks (item 10)
 - in regard to the roof claddings:
 - membrane to dormers terminates under metal roofing (item 7)
 - lack of kick-out flashings at roof/wall junctions (item 8)
 - lack of clearances from cladding to ends of gutters (item 11).
- 3.4.3 The authority also noted the change to EIFS cladding and its potential effect on structural bracing. (I note the amendment consent AC/02/09152 was issued on 11 December 2002 in response to an application outlined in paragraph 3.1.3).
- 3.4.4 The authority recommended that:
- ...you engage the services of a suitably qualified individual who is qualified in Weather Tight assessment and Remedial Design. This person must further investigate the performance of this building, also taking into account the [areas of

concerns identified] and provide a 'scope of works' and any recommendations to [the authority] for further review.

- 3.5 The builder failed to resolve the situation with the authority and applied for a determination on the applicants' behalf. The Ministry received the application on 26 November 2014 and sought further information from the parties, which was provided by 10 February 2015.

4. The submissions

4.1 The applicant's submission

- 4.1.1 The builder provided copies of:

- The authority's inspection summary
- some of the building consents
- annotated inspection list dated 30 July 2004
- annotated list extracted from the notice to rectify
- annotated letters from the authority
- various other notes.

4.2 The authority's submission

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

- the original consent drawings and specifications
- the original building consent dated 26 March 2002
- the demolition consent dated 11 July 2002
- the amendment building consent dated 11 December 2002
- the inspection records
- the notice to rectify dated 2 February 2005
- letters to the applicants dated 8 June 2006 and 29 June 2006
- a file note dated 21 September 2007
- the refusal to issue the code compliance certificate, dated 20 June 2014
- various photographs and other information.

- 4.3 A draft determination was issued to the parties for comment on 22 May 2015.

- 4.4 In a response received on 8 June 2015 the authority accepted the draft without further comment.

- 4.5 The builder provided a submission, received on 8 June 2015, largely in response to the expert's report. I have summarised that submission at paragraph 5.13.

- 4.6 On 3 July 2015 the applicants confirmed that the builder was acting as their agent for the determination and no further submission or information was forthcoming.

5. The expert's report

5.1 As mentioned in paragraph 1.6, I engaged an independent expert to assist me. The expert is a member of the New Zealand Institute of Building Surveyors and inspected the house on 17 March 2015, providing a report completed on 15 April 2015 that was forwarded to the parties on 30 April 2015.

5.2 General

5.2.1 The expert noted that variations from the original and amended drawings included:

- inconsistent drawings and notes in regard to roof over original shop
- inconsistent specification of EIFS product
- sill of bay window panel to Level 1 games room sits on concrete/brick foundation nib wall, not at floor level as per elevations
- brick veneer over cavity in lieu of '70mm brick direct fixed to blocks' (based on the overall depth from the brick face to the concrete face).

5.2.2 The expert noted that the amended drawings were limited; consisting of Level 2 and Level 3 floor plans, with bracing notes and calculations added to allow for the change from fibre-cement backed cladding which would have provided some bracing to the building. The drawings contained no installation details for the substituted EIFS to take into account the increased overall thickness.

5.2.3 The expert considered that the plaster surface finish was 'good, with the cladding having been recently repainted' and limited cracks were observed. He was advised that the building had been repainted about 3 years ago and sealant around joinery replaced, though the expert observed some areas requiring attention. The expert noted that the building 'has been subject to numerous minor repairs and alterations' mainly as a response to items identified by the authority.

5.3 Destructive investigations

5.3.1 The expert inspected the interior and observed no evidence of moisture penetration. At exterior locations considered to be high risk, the expert carried out destructive investigation, which included taking invasive moisture readings through cladding, removing small sections of soffit linings and water testing by using dyed water.

5.3.2 The expert took three timber samples for analysis and the results of his investigations are summarised in Table 1, with invasive moisture readings shown in brackets:

Table 1:

	Location	Moisture investigation	Visible damage	Timber samples
1	Level 1 games room - west end of south window	uPVC base trim missing so small section of polystyrene removed from back of cladding (over 90%)	Water stained bottom plate (above brick/concrete foundation wall)	Sample 1: Well established advanced decay – likely to cause loss of structural integrity. Spores of <i>Stachybotrys</i>
1A	Level 2 family room sill/jamb junction above location 1	Dye -tested exterior sill/jamb junction resulted in coloured water draining at Location 1.	Cracks at reveal/aluminium junction	No sample taken.

	Location	Moisture investigation	Visible damage	Timber samples
2	Level 1 games room - east end of south window	uPVC base partly dislodged and able to be pulled away to expose part of bottom plate (31%)	Visible water staining to bottom plate (above brick/concrete foundation wall)	No sample taken.
3	Roof space above Level 3 west ensuite	Extract grille removed (below 18%).	No visible evidence of moisture penetration	No sample taken.
4	Level 2 ensuite – under east end of south window	Invasive moisture test through soffit lining to bay (24%)	Not exposed	No sample taken.
5	Level 2 ensuite – under west end of south window	Small section of soffit lining removed. (over 90%)	Mould to back of fibre- cement. Framing wet and water stained.	Sample 5: Well established advanced decay – likely to cause loss of structural integrity. Spores of Stachybotrys
6	Level 2 bedroom – under west end of north window	Invasive moisture test through soffit lining to bay (13%)	Not exposed	No sample taken.
7	Level 2 dining room – under west end of north window	Invasive moisture test through soffit lining to bay (24%)	Not exposed	No sample taken.
8	Level 2 kitchen – bottom of roof/wall junction adjacent to northeast corner	Invasive moisture test through soffit lining to eaves (19%)	Not exposed	No sample taken.
9	Level 3 Deck 3 doors – under end of gutter at dormer	Small section of soffit lining removed. (12%)	Mould to back of fibre- cement. Framing currently dry but water stained.	Sample 9: Well established early to advanced decay. Spores of Stachybotrys
10	Level 2 Deck 2 – top of north balustrade	Handrail removed – tested through fixing hole (11%)	No visible damage to framing and building wrap	No sample taken.
11	Level 2 ensuite – bottom of roof/wall junction	Invasive moisture test through soffit lining to eaves (21%)	Not exposed	No sample taken.
12	Mansard roof space above Level 3 west bedroom	Removed downlights in ceiling	No visible evidence of moisture penetration	No sample taken.
13	Level 2 Deck 1 – bottom of wing wall under dormer	Through wall cladding (26%)	Not exposed	No sample taken.

5.3.3 I note the above moisture readings were taken at the end of summer and levels are expected to rise during wetter seasons, resulting in moisture damage such as that confirmed in the ‘dry’ Sample 9. Although moisture levels below 18% generally indicate that moisture has not entered the structure, in this case I consider there is likely to be historic moisture penetration not reflected by the above moisture readings due to seasonal variation.

5.3.4 The laboratory report dated 8 April 2015 noted that preservative analysis suggested that Sample 9 was treated with boron to Hazard Class 1 of MP3640:1992. No preservative was detected in Samples 1 and 5, which suggested either untreated radiata pine or the loss of boron due to leaching of the preservative over a prolonged

period. I note the saturation of timber at the two latter locations, and I consider that leaching is the more probable cause.

- 5.3.5 The report noted that the decay typically has important implications for the building in general and it is therefore ‘important to establish the limits of fungal infection and/or decay and to establish the causes, and apply appropriate remediation’. The laboratory report concluded that:

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

5.4 Windows and doors

- 5.4.1 The expert noted that joinery is recessed by the thickness of the EIFS cladding, with projecting window panels extended up to roof level and terminated at the barrel vault dormers. Panels are ‘framed’ by EIFS bands that continue up to form arched parapets above the window heads, with horizontal bands at inter-floor levels.

- 5.4.2 The expert assessed joinery installation into the EIFS, taking account of the results of his destructive investigation (see Table 1) and manufacturers’ recommendations at the time, and also noted:

- Both likely EIFS systems included uPVC sill and jamb flashings behind the plaster, with Insulclad details showing drainage gaps at sills, to allow moisture entering joinery mitres to escape to the outside

(I note that Insulclad details of July 1998 did not include uPVC soaker flashings at jamb/sill junctions, with jamb flashings butting against sill flashings and weathertightness reliant on sealant at the junction.)

- Although only isolated cracks at reveals/aluminium junctions were observed, sealants are likely to have been repaired or replaced (meaning that cracking may have been more extensive prior to repainting 3 years ago).
- Water testing a cracked sill/jamb junction above the bottom plate at Location 1 showed that water entered the junction and made its way down the framing to the decayed bottom plate. The bottom plate under the other end of the window (Location 2) also had elevated moisture and visible water stains.
- High moisture levels were also recorded under both ends of another south window at Locations 4 and 5, with the latter causing severe decay. Based on the limited site investigation, undetected moisture entry and further damage may have occurred elsewhere in the past and is likely in the future.

5.5 The gutters

- 5.5.1 The expert noted that the tiled roofs drain into concealed gutters that sit above soffit framing and lining with attached metal fascias covering junctions. The expert noted:

- the concealed gutter sections overlap the inner face of the fascia, with the exposed junction reliant on sealant for weathertightness
- the sealant has deteriorated in some areas, with gaps and cracks allowing moisture into the underlying soffit lining and framing

- where gutters terminate beside the dormers, water can drain behind adjacent EIFS; this has occurred in Location 9 where mould was apparent on the back of the fibre-cement lining and timber is decayed.

5.5.2 The expert considered that sealant failure is likely to occur that could lead to undetected moisture penetration into soffit linings, soffit framing and behind EIFS at gutter/dormer junctions.

5.6 The dormer roofs

5.6.1 The expert noted that the authority's 2005 photographs show butyl rubber membrane to the dormer roof terminating behind EIFS-clad parapets, with sealant applied at the membrane/plaster and tile/plaster junctions. After mid-2006 (see paragraph 3.3.2), a strip of membrane was installed to overlap the junctions. (I note this would have been at least 3 years after completion.)

5.6.2 The expert noted that:

- moisture may have entered vulnerable junctions prior to remedial work and current moisture levels may not reflect historic underlying damage, as shown in the damage in Location 9 where timber was decayed despite low readings.
- the overlaid strip improves weathertightness but is not durable as the membrane does not fully bond to the texture of the plastered parapet, and the edge of the membrane has lost adhesion in some locations
- the junctions of the vaulted roofs with gutters add to moisture vulnerability due to the gutter defects outlined in paragraph 5.5.1
- defects are likely to be repeated at all the vaulted roofs, as the nine dormers were constructed at the same time and in the same manner.

5.6.3 Taking account of the above, the expert considered that moisture entry and damage is likely 'to exist elsewhere and/or in the future, where not already confirmed to be failing as part of the limited site investigations completed.'

5.7 Other roof to wall junctions

5.7.1 The authority identified the lack of kick-out flashings as a concern. The expert observed a number of roof/wall junctions considered to be at high risk of moisture penetration and noted that:

- at the northeast corner of Level 2 kitchen (refer location 8, Table 1) the membrane terminates behind the EIFS with the junction reliant on sealant, and moisture had penetrated into adjacent soffit framing
- a similar situation was observed on either side of the external entry stairs, where the entry deck membrane terminates against the face of the EIFS
- at the southwest corner of Level 2 ensuite (refer location 11, Table 1) an apron flashing at the EIFS/tiled roof junction is 'reliant on a large amount of exposed sealant' that had cracked, allowing moisture penetration into adjacent framing.

5.7.2 The expert considered that such sealant failure is likely to occur that could lead to undetected moisture penetration into soffit linings and framing at other similar roof/wall junctions.

5.8 Horizontal plaster surfaces

5.8.1 The expert observed that uncapped tops to EIFS-clad deck balustrades had very little slope and noted that:

- manufacturers of both the likely EIFS systems called for a 15° fall
- despite the evidence of current moisture penetration or timber damage (refer location 10, Table 1), the uncapped balustrades rely on the underlying building wrap, the plaster, sealants and maintenance of the paint system.

5.8.2 The expert considered that moisture penetration may occur during the remaining minimum life of the cladding, given 'normal' maintenance. (I also note that two decks sit above occupied spaces, which increases the consequences of undetected moisture penetration and damage to the framing below.)

5.9 Clearances

5.9.1 The notice to rectify had identified the lack of cladding clearances to deck floors. However, the expert noted that EIFS above roofs and decks included base mouldings which would assist in preventing moisture entering via splashing. In most cases of insufficient clearances, underlying upstands reduce the potential for damage and, apart from areas identified above, the expert considered cladding clearances below EIFS cladding to be generally satisfactory.

5.9.2 In regard to the authority's concern about the lack of ground clearances at Level 1, the expert noted:

- Paving butts against the bottom of the brick veneer, covering the bottom course of brick and any weep holes in the brick. There are no current signs of surface water entry to brick/paving junctions, and Level 1 exterior walls are concrete block which decreases the risk of damage.
- However, given the lack of drainage from the brick cavity, accumulated moisture could eventually enter the concrete block walls and cause 'undue dampness' to internal linings. Damp air in the unventilated cavity could also lead to corrosion of brick ties over time.

5.10 Deck membranes

5.10.1 The authority had identified a number of concerns about the decks, which have tiles directly adhered to the underlying membrane. The expert was unable to inspect the membrane, but noted that:

- there were currently no plants on decks (refer paragraph 3.4.2) but a downpipe discharges directly onto tiles, increasing the danger of moisture penetration should the underlying membrane be defective
- sealants and tiles are dependent on maintenance, and any cracked or missing grout could damage the underlying membrane and allow moisture into framing
- two decks and the entry porch sit above occupied spaces, which increase the consequences of moisture penetration and damage to underlying framing.

5.10.2 Given the age of the membranes and the lack of evidence of moisture ingress, the expert noted that deck membranes currently appear to be weathertight.

5.11 Shop canopy membrane

5.11.1 The shop canopy drains into external gutters, with a sign top-fixed through the membrane. The authority had concerns about the fixings and the lack of fall. The expert noted that:

- the roof slope is less than the 1.5° pitch recommended⁸ at the time of construction and ponding is apparent, although there is no sign of current moisture penetration as a result
- the sign fixings are heavily reliant on exposed sealant which may break down, providing potential for future deterioration and moisture penetration.

5.12 Outcome

5.12.1 The expert noted that he had identified a number of significant defects that were currently allowing moisture penetration, or were likely to do so in the future. Those defects were systemic as they existed in multiple locations around the building, with similar moisture penetration expected in other areas. The expert also noted that his limited investigation had identified three areas of confirmed established decay damage resulting in the loss of structural integrity of the framing, and considered that further areas of decay are likely.

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

- severe decay resulting from defects identified in the cladding requires further investigation to establish the condition of other areas with similar defects
- joinery junctions are not weathertight, with evidence of moisture penetration and timber damage to some areas
- the concealed gutter system is not weathertight, with evidence of moisture penetration and timber damage to some areas
- defective junctions around dormers are likely to have leaked in the past and the current remedial work is not weathertight
- other roof to wall junctions are not weathertight and either currently allowing moisture penetration or are likely to in the future
- deck balustrades have flat plastered tops, with no cappings and no evidence of flashings at junctions with walls and columns
- paving has been built up against the lowest brick course; impeding drainage and ventilation of the cavity and risking damage to internal linings and brick ties
- the floor/cladding junction at the entry porch lacks a membrane upstand and provides potential for moisture ingress
- the shop canopy lacks sufficient fall and ponding is evident, with penetrations risking moisture penetration through the membrane.

5.12.3 Taking account of the systemic defects, the decayed framing and other defects the expert concluded that the external building envelope fails to comply with Building Code Clauses B1, E2 and B2.

⁸ BRANZ Good Practice Guide (1999)

5.13 The builder's submission

5.13.1 In response to the findings of the expert, the builder submitted:

- All interior plasterboard was inspected in January 2003, and this would only have taken place with all cladding completed and waterproofed.
- There was no requirement for the internal gutter to extend under the front edge/lip of the fascia; any water exits through the slotted vents at the base of the fascia.
- In late 2014 a butyl strip was installed over the top edge of all dormer volts to prevent water ingress through the gap between the butyl roof and EIFS cladding. This was extended into the gutter to form a continuous water path. At that time damaged timber framing, mostly north facing, was replaced with treated framing.
- The brick cladding was fixed to sealed blockwork with no cavity required; the brick cladding was seated on the concrete foundations below floor level.
- Regarding the butyl deck above the shop; if the grout to tiles is changed to waterproofing sealant in lieu of grout 'this should suffice'.
- The canopy over the shop is outside the building line. The ponding is due to the front fascia drip edge, and the fixings can be removed and holes patched with butyl.

5.13.2 The builder also commented that there was a lack of detail in the consent plans, the specifications note construction to 'NZS 3609:1990 (*sic*) and NZS 4229⁹ (or 4230¹⁰)', and that various inspections during construction had all passed.

6. Code compliance

6.1 I note that the original building consent and the amendment consent were both issued under the former Act, and accordingly the transitional provisions of the current Act apply when considering the issue of a code compliance certificate for work completed under those consents. These require the authority to issue a code compliance certificate if it 'is satisfied that the building work concerned complies with the building code that applied at the time the building consent was granted'.

6.2 In order to determine whether the authority correctly exercised its power in refusing to issue a code compliance certificate, I must therefore consider whether the building work complies with the Building Code that was in force at the time the consents were issued.

6.3 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).

⁹ New Zealand Standard 4229:1999 Concrete masonry buildings not requiring specific engineering design

¹⁰ New Zealand Standard 4230: NZS 4230:2004 Design of reinforced concrete masonry structures

6.4 Weathertightness risk

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

Increasing risk

- the building is three-storeys high and complex in form
- the building has two types of wall cladding and many complex junctions
- most walls have EIFS cladding fixed directly to the framing
- there are limited or no eaves to shelter the EIFS cladding
- there are three tiled decks, with two above internal spaces
- the majority of the external wall framing is not treated to a level that provides sufficient resistance to decay if it absorbs and retains moisture.

Decreasing risk

- the building is in a low wind zone
- most ground floor walls are concrete with brick veneer.

6.4.2 Using the E2/AS1 risk matrix to evaluate these features, all elevations are assessed as having a very high weathertightness risk rating, requiring specific weathertightness design. However this was not a requirement at the time of construction in 2003.

6.5 Weathertightness performance

6.5.1 I note that an application can be made to the authority for a modification of durability requirements to allow durability periods to commence from the date of substantial completion in 2003. Although that matter is not part of this determination (see paragraph 1.4), I have taken the anticipated modification into account when considering the weathertightness performance of the claddings as some areas of cladding have been in place for 12 of the 15 years required.

6.5.2 It is clear from the expert's report that the building envelope is unsatisfactory in terms of its weathertightness performance, which has resulted in moisture penetration and severe decay in some areas. Taking into account the expert's report and the limited nature of his investigations, I conclude that the areas outlined in paragraph 5.12.2 require attention, however I note this list should not be considered complete.

6.5.3 The evidence of preservative leaching and advanced timber decay to each of the three samples taken is of concern, and I consider that further opening up of the structure is likely to reveal further decay of the wall framing, which could compromise the structural integrity of the building.

6.5.4 Extensive investigation is necessary, including the systematic survey of all risk locations. Such a survey will need to incorporate invasive moisture and sample testing and the exposure of framing where necessary in order to determine the full extent of past and present moisture penetration, the level and extent of timber damage and the repairs now required.

6.6 Weathertightness conclusion

- 6.6.1 I consider the expert's report establishes that the current performance of the building envelope is not adequate because there is evidence of moisture penetration and decay in the timber framing. Consequently, I am satisfied that the building structure and envelope do not comply with Clauses B1, B2 and E2 of the Building Code
- 6.6.2 In addition Clause B2 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. Careful attention to the performance of the external envelope is needed to ensure that it protects the underlying structure for the minimum required life of 50 years.
- 6.6.3 Because of the extent and apparent complexity of faults identified in the exterior building envelope, I am unable to conclude that fixing the identified faults, as opposed to partial or full re-cladding, could result in compliance with clauses B2 or E2. Final decisions can only be made after a more thorough investigation of the claddings, which will require a careful analysis by an appropriately qualified expert. Once that decision is made, the chosen repair option should be submitted to the authority for its consideration and approval.

7. The durability considerations

- 7.1 The relevant provision of Clause B2 of the Building Code requires that building elements must, with only normal maintenance, continue to satisfy the performance requirements of the Building Code for certain periods ("durability periods") "from the time of issue of the applicable code compliance certificate" (Clause B2.3.1).
- 7.2 In many previous determinations I have taken the view that a modification of this requirement can be granted if I can be satisfied that the building complied with the durability requirements at a date earlier than the date of issue of the code compliance certificate, that is agreed to by the parties and that, if there are matters that are required to be fixed, they are discrete in nature.
- 7.3 However, because of the extent of further investigation required into the condition of the timber framing and therefore the structure of the house, and the potential impact of such an investigation on the external envelope, I am not satisfied that there is sufficient information on which to make a decision about this matter at this time.

8. What happens next?

- 8.1 I note that the building consent was issued to the current owners of the house, and the authority is therefore able to issue a notice to fix in respect of breaches of the Act or Regulations. Any notice to fix should require the owners to bring the building into compliance with the Building Code, identifying at least the areas and investigations outlined in paragraph 5.12.2 and referring to any further defects that might be discovered in the course of investigation and rectification.
- 8.2 I suggest that the parties adopt the following process to meet the requirements of paragraph 8.1. Initially, the authority should re-inspect the building, taking account of the findings of this determination, and then issue a notice to fix. The applicant should then produce a response to this in the form of a detailed proposal for the house as to the rectification or otherwise of the specified matters. That proposal should be produced in conjunction with a competent person with suitable experience

in weathertightness remediation and should 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.

9. The decision

9.1 In accordance with section 188 of the Building Act 2004, I hereby determine that in regards to the Building Code that was in force at the time the consents were issued:

- the wall framing does not comply with Clauses B1 and B2
- the exterior building envelope does not comply with Clauses E2 and Clause B2

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

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 8 July 2015.

John Gardiner
Manager Determinations and Assurance